

DAVE : I DON'T WANT TO ENTER ALL THESE.
WHICH DO WE
ORDER?

SAFETY DEPARTMENT
REQUEST FOR INFORMATION
ON MSDS

I've marked
the names.

TO D. DURHAM DATE 10-13-87

PLEASE FILL IN ALL THE INFORMATION YOU CAN TO AID IN PLACING THE MSDS
ATTACHED INTO OUR RECORDS:

WHO ORDERED THIS MATERIAL? _____

DEPARTMENT (Name and Cost Code) _____

WHERE IS THE MATERIAL USED? _____

WHAT IS IT USED FOR? _____

PLEASE RETURN TO THE SAFETY DEPARTMENT A.S.A.P.

153763

TELEPHONE: 781-2100
AREA CODE 314

SUNNEN PRODUCTS COMPANY

7910 MANCHESTER AVENUE, ST. LOUIS, MISSOURI 63143

October 12, 1987

Dear Customer:

Please distribute the attached documents to the person(s) responsible for the collection and distribution of material safety data sheets in your organization. Kindly direct any questions concerning these documents to the undersigned.

Sincerely,
SUNNEN PRODUCTS COMPANY



Terry Heller
Manager, Materials R & D

C01334



MSDS 01

NFPA DESIGNATION 704

MATERIAL SAFETY DATA SHEET

HAZARD RATING	HEALTH	1
4=Extreme	FLAME	0
3=High	REACTIVITY	0
2=Moderate		
1=Light		
0=Insignificant	SPECIFIC HAZARD	NONE

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION:

Sunnan Mandrel Shoe: UA-B, UA-C, UA-CH, UB-B, UB-C, UB-CH, UC-B, UC-C, UC-CH, UD-B, UE-B, LA-C, LA-B, LA-CH, LB-B, LB-C, LB-CH, LC-B, LC-C, LC-CH, VA-B, VA-C, VA-CH, VB-B, VB-C, VB-CH, WC-B, WC-C, WC-CH, WD-B, WE-B, WE3-D, WF-B, WF-D, WG-B, WG-SC-B, SD-B, PB-B, PB-N, PC-B, PC-N, PD-B, PD-N, PE-B, PE-N, PF-B, PF-N, PG-B or PH-B.

Sunnan Honing Mandrels: AS, AS, AN, BS, BS, BN, CB, CS, or CH suffix or with AK20, JAK20, BAL20 or AL20 prefix.
 (Example: K5-150CS or AK20-744UA)

Sunnan Truing Sleeve: S or ST Prefix. (Example: S-120 or ST-744)

CHEMICAL FAMILY: METAL ALLOY. CLASSIFICATION: Machine, Machine Parts. D.O.T. SHIPPING CLASS: Class 85

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
IRON	IRON	7439-89-6	10 as Iron Oxide fume	5.0 as Iron Oxide fume	N
COPPER	COPPER	7440-50-8	1.0 / 0.1 fume	1.0 / 0.2 fume	N
COBALT	COBALT	7440-48-4	0.1	.05 dust and fume	N (1)
TIN	TIN	7440-31-5	2.0	2.0 / 2.0 fume	N
CARBON	CARBON	7440-44-0	3.5 as Carbon Black	3.5 as Carbon Black	N
MANGANESE	MANGANESE	7439-96-5	5.0	5.0 / 1.0 fume	N
ALUMINUM	ALUMINUM	7429-90-5	NONE	10	N
CHROMIUM	CHROMIUM	7440-47-3	1.0	0.5	N (1)
NIOBYDEMIUM	NIOBYDEMIUM	7439-98-7	15	10	N
NICKEL	NICKEL	7440-02-0	1.0	1.0	Y
SILICON	SILICON	7440-21-3	NONE	5 as respirable dust	N
LEAD	LEAD	7439-92-1	0.1	.15	N
ZINC	ZINC	7440-66-6	5.0 as Zinc Oxide fume	5.0 as Zinc Oxide fume	N

(1) CERTAIN COMPOUNDS OF CHROMIUM AND COBALT HAVE BEEN IDENTIFIED AS SUSPECT HUMAN CARCINOGENS BY I.A.R.C., N.T.P. ANNUAL REPORT.

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)----7.8 (APPROX)
 MELTING POINT-----1100-2500 F (593-1371 C) APPROX.
 SOLUBILITY IN WATER-----NOT SOLUBLE
 VAPOR PRESSURE (mm Hg)-----NOT VOLATILE
 APPEARANCE AND ODOR-----SOLID METAL OBJECT. ANTI-RUST COATING HAS ODOR OF KEROSENE.

REACTIVITY IN WATER-----NOT REACTIVE
 EVAPORATION RATE-----NOT VOLATILE
 VAPOR DENSITY (AIR=1)-----NOT VOLATILE
 PERCENT VOLATILE BY WEIGHT-----NOT VOLATILE

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Acids, Bases or Strong Oxidizing Agents. HAZARDOUS DECOMPOSITION PRODUCTS: METAL FUMES IF HEATED Anti-rust coating is combustible and will produce oxides of carbon.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES. Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever (flu-like symptoms). Symptoms may be aggravated for sensitive individuals with respiratory conditions (such as emphysema). Persons with light skin, sensitive skin or large amounts of body hair may experience skin disorders from contact with metal fumes.

ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

CARBON: ACUTE: SKIN: May cause irritation. EYE: May cause irritation and swelling. INHAL: May cause irritation to the nose or throat (Bronchitis). INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: As graphite. May produce a progressive and disabling lung disease. Symptoms include headache, coughing, depression, decreased appetite, difficult breathing and the production of black sputum. Individuals may be free of symptoms for many years and then suddenly become disabled. INGEST: NAIF.

CHROMIUM: ACUTE: SKIN: Chromium compounds may cause dermatitis. EYE: May cause irritation. INHAL: Dusts of the metal may cause coughing and wheezing, headache, difficult breathing, fever and loss of weight. INGEST: Literature reports the oral toxicity as LD Lo=71 mg/kg (Mamsters). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: There are reports of a nodular type of breathing disease with impairment of lung function. Some insoluble chromium compounds are suspected carcinogens. INGEST: NAIF.

COBALT: ACUTE: SKIN: Cobalt can cause an allergy. Literature reports very small quantities have caused allergic sensitivity type dermatitis. Eruptions are usually located in the flexure creases of the elbow, knee, ankles, and neck. Cross sensitization can occur between cobalt and nickel and cobalt and chromium. EYE: May cause irritation. INHAL: Cobalt dust inhalation may cause an asthma-like disease characterized by coughing and difficult breathing. INGEST: Literature reports the oral toxicity to be LD Lo=1500 mg/kg (rats). Ingesting cobalt dust can cause vomiting and diarrhea. A sensation of hotness may occur after ingestion of excessive amounts. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Inflammation of the lungs that may be reversible and abnormal tissue growth. INGEST: NAIF.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

IRON: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: The inhalation of iron oxide fumes or dust may cause an apparent benign lung disease which is called siderosis. This disease is reported not to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible. INGEST: NAIF.

LEAD: ACUTE: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Early symptoms of lead poisoning include fatigue, headache, digestive symptoms, abdominal pain and decreased appetite. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Affects the nerves causing severe headache, convulsions, coma, delirium and possible death. Causes kidney damage and reduction in the number of circulating red blood cells.

MANGANESE: ACUTE: SKIN: NAIF. EYE: May cause slight eye irritation. INHAL: Can cause bronchitis and inflammation of lung. Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. Freshly formed fumes can cause fever and chills similar to the flu. INGEST: Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Manganese poisoning is not fatal but may present a large range of nervous system disorders that vary among individuals. Advanced symptoms are similar to classical Parkinson's disease.

MOLYBDENUM: ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: Inhalation of the dust or fumes of this metal can cause upper respiratory system irritation. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Literature reports experiments with animals have shown cumulative liver and kidney damage (fatty changes) and blood disorders. INGEST: High dietary intake of molybdenum has been reported to be associated with a gout-like disease and high blood uric acid.

NICKEL: ACUTE: SKIN: NAIF. EYE: Causes eye irritation. INHAL: Nickel is an irritant to the mucous membrane of the upper respiratory tract. INGEST: Literature reports nickel soluble salts are quite toxic and if swallowed may cause giddiness and nausea. CHRONIC: SKIN: Skin sensitization resulting in chronic eczema "Nickel Itch". EYE: NAIF. INHAL: Elemental nickel (as deposited from inhalation of nickel carbonyl) and nickel salts may cause cancer (producing an increased incidence of cancer of the lung and nasal passages). Effects on the heart muscle, brain, liver, and kidney have been seen in animal studies. INGEST: NAIF.

SILICON: ACUTE: SKIN: Physical damage to the skin caused by dust or by cleaning procedures used to remove it. EYE: Dust may irritate eyes. INHAL: Dust may cause physical damage to the mucous membranes or nasal passages. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May produce x-ray changes in the lungs without disability. INGEST: NAIF.

TIN: ACUTE: SKIN: May cause skin irritation. EYE: May irritate eyes. INHAL: May irritate the mucous membranes. INGEST: Literature reports the toxicity is low. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Exposure to the dust or fumes of tin oxide can result in a benign lung disease called stannosis. No tissue reaction or breathing disorder has been associated with this lung condition. INGEST: NAIF.

ZINC: ACUTE: SKIN: Zinc oxide may produce a dermatitis called "oxide pox" due primarily to clogging of the sweat glands. EYE: NAIF. INHAL: Can cause flu like symptoms beginning four to twelve hours after exposure. Causes sweet or metallic taste in the mouth, dryness and irritation of the throat. Fever and shaking chills then develop. Symptoms last 24 to 48 hours. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.

EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Brush off excess dust. Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: No special procedures required. **NORMAL USE:** No special procedures required. **STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS:** Treat chips or dust as metal alloys. **WASTE DISPOSAL METHODS:** Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If conditions of use (Dry Honing, cutting, or grinding of shoe) give rise to dust use NIOSH approved respirator rated for metal dust to maintain levels of dust below ACGIH TLV and OSHA PEL/TLV levels. **VENTILATION:** If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering of shoe) give rise to metal fumes use forced ventilation to maintain levels of fumes well below ACGIH TLV and OSHA PEL/TLV levels. **SKIN PROTECTION:** Not required. **EYE PROTECTION:** Always wear NIOSH approved safety glasses when honing or operating machinery. **OTHER EQUIPMENT:** No applicable information found. **MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL:** Remove traces of material dust if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

Material in the solid state does not present a fire or explosion hazard. Dust hazards exist under favoring conditions of small particle size. Dispersion in air and strong ignition source may result in an explosion.

NOTICE

THIS MATERIAL SAFETY DATA SHEET ("MSDS") IS SUPPLIED PURSUANT TO THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S HAZARD COMMUNICATION RULE (THE "RULE"), 29 CFR 1910.1200. THIS MSDS IS BEING FURNISHED TO THE IMMEDIATE PURCHASER OF THE MATERIAL TO WHICH IT REFERS WITHOUT REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS OR ACCURACY OF ANY INFORMATION OR RECOMMENDATIONS CONTAINED HEREIN.

THIS MSDS IS OFFERED SOLELY TO COMPLY WITH THE RULE AND IS NOT INTENDED TO CREATE ANY LIABILITY OF ANY KIND ON THE PART OF SUNNEN PRODUCTS COMPANY ("SUNNEN"). IN NO EVENT WILL SUNNEN BE RESPONSIBLE FOR ANY DEATH, INJURY OR DAMAGE OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF, RELIANCE UPON, OR MISUSE OF THE MSDS. NO REPRESENTATIONS OR WARRANTIES, WHETHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER NATURE, ARE MADE HEREUNDER. THIS MSDS IS NOT INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR EXTEND LICENSES UNDER VALID PATENTS.

THIS MSDS IS FURNISHED UPON THE EXPRESS CONDITION THAT ALL PERSONS RECEIVING IT WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSED PRIOR TO USE. RESPONSIBILITY FOR COMPLIANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS CONCERNING DISSEMINATION OF THE MSDS AND SALE AND USE OF THE MATERIAL TO WHICH IT REFERS RESTS SOLELY UPON THE PURCHASER.



SECTION 1 NAME AND PRODUCT

HAZARD RATING	- HEALTH	1 -
4=Extreme		
3=High	- FIRE	0 -
2=Moderate		
1=Slight	- REACTIVITY	0 -
0=Insignificant		
	- SPECIFIC HAZARD	NONE -

MANUFACTURER'S NAME: SUNSHINE PRODUCTS COMPANY CONTACT: Terry Heller
ADDRESS: 7910 Manchester Ave. EMERGENCY PHONE NO: 314-781-2105
St. Louis, Mo. 63143 APPROVED BY: Terry Heller
United States of America TITLE: Manager, Materials R/D
DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen Honing Stones: A, J and C Abrasive (Example: K10-A57 or P28-C07), or AMU, CR, EEU, EAU, EVM, ENU, ECH, EHM, ECU, ENU, ENU, ENU; MB, JMU, JUB, JUC, KL, LH, LD, ML, PL, RY, RYT, SC, SK, STY, UL, XMB and XSC Prefix (Example: JNU-625). CHEMICAL FAMILY: Mixture. Vitrified or Superabrasive Honing Stone that may contain various fibrous and organic binders mounted on a Zinc holder. CLASSIFICATION: Machine. Machine Parts. D.O.T. SHIPPING CLASS: Class 85

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(q))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
STONE HOLDER					
ZINAK	ZINC	7440-66-6	5.0 as oxide fume	5.0 as oxide fume	N
COPPER	COPPER	7440-50-8	1.0 / 0.1 fume	1.0 / 0.2 fume	N
ALUMINUM	ALUMINUM	7429-90-5	NONE	10 dust	N
MAGNESIUM	MAGNESIUM	7439-95-4	15 as oxide fume	10 as oxide fume	N
ABRASIVE					
ALUMINUM	ALUMINUM OXIDE	1344-28-1	15 Total Dust	10 Total Dust	N
CRYSTOLON	SILICON CARBIDE	409-21-2	15 Total Dust	10 Total Dust	N
FLUORIDES	FLUORIDES (as F)	NONE	2.5	2.5	N
ABRASIVE BOND SYSTEM					
TIN	TIN	7440-31-5	2.0	2.0 / 2.0 fume	N
WAX	PARAFFIN	8002-74-2	NONE	2.0 fume	N
FIBERGLASS	GLASS, FIBROUS OR DUST	NONE	5.0 as Respirable Dust	10	N
SULFUR	SULFUR	7704-34-9	13 as Dioxide Fume	5.0 as Dioxide fume	N
LIME	CALCIUM OXIDE	1305-78-8	5.0	2.0	N
ADHESIVE					
CAMPBOR	CAMPBOR	76-22-2	2.0	12	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUMNER PRODUCTS.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----5 (APPROX)	VAPOR DENSITY (AIR=1) ---NOT VOLATILE
MELTING POINT-----> 728 F (387 C) HOLDER	EVAPORATION RATE -----NOT VOLATILE
PERCENT VOLATILE BY WEIGHT-----NOT VOLATILE	SOLUBILITY IN WATER-----NOT SOLUBLE
VAPOR PRESSURE (mm Hg)-----NOT VOLATILE	REACTIVITY IN WATER-----STONE HOLDER WILL SLOWLY CORRODE.
APPEARANCE AND ODOR-----SOLID OBJECT	

SECTION 4 SPECIAL PRECAUTIONS: None Refer to MSDS Section 7 & 8

SECTION 5 CORROSIVITY AND REACTIVITY DATA

SECTION 5 CORROSIVITY AND REACTIVITY DATA STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Acids of all types with $\text{pH} < 4.0$, bases or strong oxidizing agents. HAZARDOUS DECOMPOSITION PRODUCTS: Metal fumes if heated. Oxides of Nitrogen as oxidation products of cement.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES. Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever (flu-like symptoms). Symptoms may be aggravated for sensitive individuals with respiratory conditions (such as emphysema). Persons with light skin, sensitive skin or large amounts of body hair may experience skin disorders from contact with metal fumes.

ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. INHAL: Nuisance dust. INGEST: NAIF. **CHRONIC:** SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

CALCIUM OXIDE: ACUTE: SKIN: Irritating and may be caustic to the skin. May produce burns or dermatitis with flaking skin and rash. EYE: Irritating and may be caustic to eye. INHAL: Irritating and may be caustic to the mucous membranes of upper respiratory tract causing inflammation and damage. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Bronchitis and lung disease. INGEST: NAIF.

CAMPHOR: ACUTE: SKIN: May cause skin irritation. EYE: May cause eye irritation. INHAL: Irritates mucous membranes. Affects central nervous system causing nausea, vomiting, diarrhea, headaches, dizziness, excitement, irrational behavior and convulsions. INGEST: Irritates mucous membranes. Affects central nervous system causing nausea, vomiting, diarrhea, headaches, dizziness, excitement, irrational behavior and convulsions. **CHRONIC:** SKIN: NA/IF. EYE: NA/IF. INHAL: NA/IF. INGEST: NA/IF.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea.

CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

FLUORIDES: ACUTE: SKIN: May cause skin irritation. EYE: May cause eye irritation. INHAL: Irritating to the mucous membranes and lungs. INGEST: Nausea, vomiting, abdominal cramps, and diarrhea. CHRONIC: SKIN: Can cause systemic effects of fluoride poisoning by absorption thru the skin. EYE: NAIF. INHAL: Nosebleeds and sinus trouble. Inhalation of excessive concentration of elemental fluorine can cause irreparable damage to the lungs and death. INGEST: Large doses produce central nervous system involvement with twitching of muscle groups, convulsions and coma. Fluorides are retained in bone, and excessive intake may result in an bone disease that is recognizable by x-ray.

GLASS, FIBROUS OR DUST: ACUTE: SKIN: May cause skin irritation. EYE: May cause eye irritation. INHAL: May irritate the upper respiratory tract. **INGEST: NAIF** **CHRONIC:** SKIN: NAIF. EYE: NAIF. INHAL: Fibers smaller than 3.5 μ m have the ability to penetrate to the air cells of the lung. **INGEST: NAIF.**

MAGNESIUM: ACUTE: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

PARAFFIN: ACUTE: SKIN: May cause irritation. EYE: NAIF. INHAL: NAIF. INGEST: NAIF. **CHRONIC:**
SKIN: Dermatitis, clogged pores and blackheads. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

SILICON CARBIDE: ACUTE: SKIN: Dust may irritate skin. EYE: Dust may irritate eyes. INHAL: Nuisance particulate. INGEST: NAIF. **CHRONIC:** SKIN: NAIF. EYE: NAIF. INHAL: Progressive lung disease. INGEST: NAIF.

SULFUR: ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: May cause excessive tissue fluid in the lungs. Gaseous sulfur dioxide is irritating to mucous membranes of the upper respiratory tract. INGEST: Not toxic. Used in medicine as a laxative. **CHRONIC:** SKIN: NAIF. EYE: NAIF. INHAL: Chronic exposure may result in inflammation of the nose, fatigue, altered sense of smell, and chronic bronchitis. Symptoms are shortness of breath, cough, and increased mucous excretion. Animal experimentation has indicated that sulfur dioxide may be a possible co-carcinogenic agent. INGEST: NAIF.

TIN: ACUTE: SKIN: May cause skin irritation. EYE: May irritate eyes. INHAL: May irritate the mucous membranes. INGEST: Literature reports the toxicity is low. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Exposure to the dust or fumes of tin oxide can result in a benign lung disease called stannosis. No tissue reaction or breathing disorder has been associated with this lung condition. INGEST: NAIF.

ZINC: ACUTE: SKIN: Zinc oxide may produce a dermatitis called "oxide pox" due primarily to clogging of the sweat glands. EYE: NAIF. INHAL: Can cause flu like symptoms beginning four to twelve hours after exposure. Causes sweet or metallic taste in the mouth, dryness and irritation of the throat. Fever and shaking chills then develop. Symptoms last 24 to 48 hours. INGEST: NAIF. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.

EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Brush off excess dust. Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES NORMAL STORAGE AND HANDLING: No special procedures required. NORMAL USE: No special procedures required. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Treat chips or dust as metal alloys. WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION RESPIRATORY PROTECTION: If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering of stone) give rise to dust use NIOSH approved respirator rated for metal dust to maintain levels of dust below ACGIH and OSHA TLV/PEL levels. VENTILATION: If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering of stone) give rise to metal fumes use forced ventilation to maintain levels of fumes below ACGIH and OSHA TLV/PEL levels. SKIN PROTECTION: Not required. EYE PROTECTION: Always wear approved safety glasses when honing or operating machinery. See OSHA 29 CFR 1910.133. OTHER EQUIPMENT: No applicable information found. MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: No applicable information found.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

Material in the solid state does not present a fire or explosion hazard. Dust hazards exist under favoring conditions of small particle size. Dispersion in air and strong ignition source may result in an explosion.

NOTICE

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MPPA DESIGNATION 704

HAZARD RATINGS	- HEALTH	1	-
4=Extreme			
3=High	- FIRE	1	-
2=Moderate			
1=Slight	- REACTIVITY	0	-
0=Insignificant			
	- SPECIFIC HAZARD	NONE	-



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: MB-30 HONING OIL
 VES-20657 SEAT CUTTING OIL

CHEMICAL FAMILY: PETROLEUM-BASED LUBRICATING OIL WITH NON-PETROLEUM FATTY ADDITIVES AND METAL DEACTIVATOR.
 CLASSIFICATION: PETROLEUM OIL N.O.S.
 D.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID
 IDENTIFICATION NUMBER: NA1270

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
MINERAL OIL	PETROLEUM DISTILLATE	64741-44-2	5 (mist)	5 (mist)	N
MINERAL OIL	PETROLEUM DISTILLATE, SEVERELY HYDROTREATED, LIGHT NAPHTHENIC	64742-53-6	5 (mist)	5 (mist)	N
MINERAL OIL	PETROLEUM DISTILLATE, SEVERELY HYDROTREATED, HEAVY NAPHTHENIC	64742-52-5	5 (mist)	5 (mist)	N
SULFURIZED FAT	SULFURIZED FATTY OIL	61790-49-6	NONE	NONE	N
FAT	ANIMAL FATTY OIL	8016-28-2	NONE	NONE	N
TOLYLTRIAZOLE	TOLYLTRIAZOLE	29385-43-1	NONE	NONE	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----904
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT----->500 F (260 C)
 VAPOR PRESSURE (mm Hg)-----<1mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----No applicable information found.
 EVAPORATION RATE-----Negligible
 SOLUBILITY IN WATER-----Negligible. Material is completely soluble in common hydrocarbon or chlorinated hydrocarbon solvents such as mineral spirits or trichloroethane.
 REACTIVITY IN WATER-----Not reactive.
 APPEARANCE AND ODOR-----Dark brown mobile liquid with characteristic odor of sulfurized fat.

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: NONE Refer to section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Material is stable under normal conditions of transport and storage.
 POLYMERIZATION: Hazardous polymerization will not occur.
 INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidation agents such as fuming nitric acid can produce a violent reaction. Material may react with any amount of alkali such as part cleaners to form corresponding amounts of soaps and/or emulsions.
 CONDITIONS TO BE AVOIDED: Do not use near sparks flames or other sources of ignition. Do not smoke in the presence of oil mist.
 HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of sulfur, carbon monoxide and carbon dioxide as products of combustion.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INHALATION AND SKIN ABSORPTION.
 ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

ACUTE

CHRONIC

MINERAL OIL

SKIN ABSORPTION: May irritate the skin.

Predisposing factors: Usually individuals with sensitive skin or large amounts of body hair. Material is not sterile and may infect open cuts or sores. When tested, MB-30 was judged to be non-irritating per 16 CFR 1500.3(c)(4).

Primary irritation index=2 (Albino Rabbits).

INGESTION: Acute oral toxicity: LD 50>5 gm./kg. (rats).

INHALATION: Observe ACGIH limits for oil mist. Symptoms of overexposure to oil mist include coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mists or vapors.

EYE CONTACT: When tested, MB-30 was judged to be non-irritating per 16 CFR 1500.42. No corneal opacity, iritis or moderate conjunctival irritation after; 1,2,3 days (Draize, rabbits).

Prolonged repeated skin contact can cause skin irritation or oil acne; inflammation and blackheads due to mechanical blockage of the pores. Prolonged or repeated exposure may aggravate existing dermatitis.

None known.

None known.

None known.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.

SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. INGESTION: Do not induce vomiting. Call physician or poison control center immediately.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water. Product may separate if exposed to temperatures below 50 F. If so, material should be heated to 50 F and mixed prior to transfer of contents. Vent container by removing lid while heating.

NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Empty drums should be completely drained, properly closed and returned to a drum conditioner to be commercially cleaned. Otherwise, containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. Notify Coast Guard if spill could reach any waterway (1-800-424-8802) and also notify state/local authorities.

WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use a NIOSH approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure to well below TLV levels.

VENTILATION-LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M.
OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.

OTHER EQUIPMENT: Oil-impervious apron if desired.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----310 F (155 C) ASTM D-92

FLAMMABLE LIMITS--- LEL: UNKNOWN UEL: UNKNOWN

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Meller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Meller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: CK50 AND MAN845 HONING OIL

CHEMICAL FAMILY: PETROLEUM HYDROCARBONS AND ADDITIVES

CLASSIFICATION: PETROLEUM OIL N.O.S.

D.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID

IDENTIFICATION NUMBER: NA1270

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT.%	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
REFINED MINERAL OIL		64741-44-2	> 90	5 (mist)	5 (mist)	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----0.85
 PERCENT VOLATILE BY WEIGHT-----1%
 BOILING POINT-----600 F (316 C)
 VAPOR PRESSURE (mm Hg)-----1mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----No applicable information found.
 EVAPORATION RATE-----NEGLECTIBLE
 SOLUBILITY IN WATER-----NEGLECTIBLE. MATERIAL IS COMPLETELY SOLUBLE IN COMMON HYDROCARBON OR CHLORINATED HYDROCARBON SOLVENTS SUCH AS MINERAL SPIRITS OR TRICHLOROETHANE.
 REACTIVITY IN WATER-----NOT REACTIVE
 APPEARANCE AND ODOR-----ASTM 8.0 LIQUID.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDATION AGENTS SUCH AS FUMING NITRIC ACID. PRODUCT MAY REACT WITH ALKALAI SUCH AS PART CLEANERS TO FORM SOAPS AND/OR EMULSIONS.

CONDITIONS TO BE AVOIDED: OXIDIZING CONDITIONS. MIXING WITH WATER OR ALKALAI (FORMS SOAPS).
 HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF SULFUR, CARBON MONOXIDE AND CARBON DIOXIDE AS PRODUCTS OF COMBUSTION.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION.
 ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

ACUTE: Prolonged repeated skin contact with material may lead to irritation caused by dissolving of the natural oils from the skin causing slight skin irritation.
 ORAL TOXICITY (RATS): Slightly toxic (estimated)--based on testing of similar products and/or the components.
 DERMAL TOXICITY (RABBITS): Slightly toxic (estimated)--based on testing of similar products and/or the components.
 INHALATION TOXICITY (RATS): Not established.
 EYE IRRITATION (RABBITS): Expected to be non-irritation.--Based on testing of similar products and/or the components.
 SKIN IRRITATION (RABBITS): May cause slight irritation on prolonged or repeated contact.--Based on testing of similar products and/or the components.

CHRONIC: No applicable information found.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.
 SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. INGESTION: Do not induce vomiting. Administer vegetable oil. Get medical assistance. (Note to physician: Material if aspirated into the lungs may cause chemical pneumonitis. Treat appropriately).

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water.

NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Empty drums should be completely drained, properly closed and returned to a drum conditioner to be commercially cleaned. Otherwise, containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. Notify Coast Guard if spill could reach any waterway (1-800-424-8802).

WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use a NIOSH approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure to well below TLV levels.

VENTILATION-LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M.
 OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.

OTHER EQUIPMENT: Oil-impervious apron if desired.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----245 F (118 C) ASTM D-92

FLAMMABLE LIMITS--- LEL: 0.6 UEL: 7.0

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

NOTICE

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MPA DESIGNATION 704



MSDS 05

HAZARD RATING	HEALTH	1
4=Extreme		
3=High	FIRE	0
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE

MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY CONTACT: Terry Heller
 ADDRESS: 7910 Manchester Ave. EMERGENCY PHONE NO: 314-781-2105
 St. Louis, Mo. 63143 APPROVED BY: Terry Heller
 United States of America TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen Superabrasive Stone:NR, DR, MV or DV (Example K8-NR51).

CHEMICAL FAMILY: Product is a Superabrasive Honing Stone containing various fillers and phenolic and/or polyimide binders (thermosetting mixtures), mounted on a steel holder. CLASSIFICATION: Machine, Machine Parts. D.O.T. SHIPPING CLASS: Class B5

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO.	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
CHROME OXIDE	CHROMIUM OXIDE	1308-38-9	1.0	.05	Y
COPPER	COPPER	7440-50-8	1.0 / 0.1 fume	1.0 / 0.2 fume	N
TIN	TIN	7440-31-5	2.0	2.0 / 2.0 fume	N
DIAMOND	CARBON	7440-44-0	3.5 as Carbon Black	3.5 as Carbon Black	N
MANGANESE	MANGANESE	7439-96-5	5.0	5.0 / 1.0 fume	N
ALUMINUM POWDER	ALUMINUM	7429-90-5	NONE	10	N
MOLYBDENUM	MOLYBDENUM	7439-98-7	15	10	N
MOLYBDENUM DISULFIDE	MOLYBDENUM DISULFIDE	1317-33-5	15	10	N
NICKEL	NICKEL	7440-02-0	1.0	1.0	Y
PHOSPHOROUS	PHOSPHOROUS	7723-14-0	0.1	0.1	N
SILICON POWDER	SILICON	7440-21-3	NONE	5.0 as respirable dust	N
GRAPHITE	GRAPHITE	7782-42-5	15 MPPCF	5.0 (Total Dust)	N
LIME	CALCIUM OXIDE	1305-78-8	5.0	2.0	N
IRON OXIDE	IRON OXIDE FUME	1309-37-1	10	5.0	N
ALUMINUM	ALPHA-ALUMINA	1344-20-1	15 (Total Dust)	10 (Total Dust)	N
CRYSTOLON	SILICON CARBIDE	409-21-2	15 (Total Dust)	10 (Total Dust)	N
SILVER	SILVER	7440-22-4	.01	0.1	N
CRYOLITE	SODIUM FLUOALUMINATE	15096-52-3	NAIF	2.5	N
COBALT	COBALT	7440-48-4	0.1	.05	N
CARBIDE	TUNGSTEN CARBIDE	12070-12-1	5.0	5.0	N
FURFURAL	FURFURAL	98-01-1	5.0 PPM	8.0	N
CRYSTALLINE QUARTZ	CRYSTALLINE QUARTZ	14808-60-7	0.3	0.1	N
CURED PHENOLIC OR POLYIMIDE	CURED PHENOLIC OR POLYIMIDE	NAIF	10	10	N
FIBROUS GLASS DUST	FIBROUS GLASS DUST	16997-17-3	15	10	N
EPOXY	CURED RESIN	NAIF	NAIF	NAIF	N

(1) CERTAIN COMPOUNDS OF CHROMIUM, NICKEL AND COBALT HAVE BEEN IDENTIFIED AS SUSPECT HUMAN CARCINOGENS BY I.A.R.C., N.T.P. ANNUAL REPORT. MPPCF=millions of particles per cubic foot of air. PPM=Parts/Million. NAIF=No applicable information found. FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----7 (APPROX)	EVAPORATION RATE -----NOT VOLATILE
MELTING POINT-----428 F (220 C) APPROX.	SOLUBILITY IN WATER-----NOT SOLUBLE
PERCENT VOLATILE BY WEIGHT-----NOT VOLATILE	REACTIVITY IN WATER-----NOT REACTIVE
VAPOR PRESSURE (mm Hg)-----NOT VOLATILE	APPEARANCE AND ODOR-----SOLID OBJECT
VAPOR DENSITY (AIR=1)-----NOT VOLATILE	

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Acids, bases or strong oxidizing agents. HAZARDOUS DECOMPOSITION PRODUCTS: Metal fumes if heated.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES. Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever (flu-like symptoms). Symptoms may be aggravated for sensitive individuals with respiratory conditions (such as emphysema). Persons with light skin, sensitive skin or large amounts of body hair may experience skin disorders from contact with metal fumes. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION
ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. (INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

ALPHA ALUMINA: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: Nuisance particulate. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF INGEST: NAIF.

CARBON: ACUTE: SKIN: May cause irritation. EYE: May cause irritation and swelling. INHAL: May cause irritation to the nose or throat (Bronchitis). INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: As graphite. May produce a progressive and disabling lung disease. Symptoms include headache, coughing, depression, decreased appetite, difficult breathing and the production of black sputum. Individuals may be free of symptoms for many years and then suddenly become disabled. INGEST: NAIF.

CALCIUM OXIDE: ACUTE: SKIN: Irritating and may be caustic to the skin. May produce burns or dermatitis with flaking skin and rash. EYE: Irritating and may be caustic to eye. INHAL: Irritating and may be caustic to the mucous membranes of upper respiratory tract causing inflammation and damage. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Bronchitis and lung disease. INGEST: NAIF.

CHROMIUM OXIDE: ACUTE: SKIN: Can act as an allergen and cause skin irritation. EYE: May cause irritation. INHAL: Dusts may cause coughing and wheezing, headache, shortness of breath, fever and loss of weight. INGEST: Literature reports the oral toxicity as LD Lo=71mg/kg (Mamsters). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Literature reports lung disease with impairment of lung function. Some insoluble chromium compounds are suspected carcinogens. INGEST: NAIF.

COBALT: ACUTE: SKIN: Cobalt can cause an allergy. Literature reports very small quantities have caused allergic sensitivity type dermatitis. Eruptions are usually located in the flexure creases of the elbow, knee, ankles, and neck. Cross sensitization can occur between cobalt and nickel and cobalt and chromium. EYE: May cause irritation. INHAL: Cobalt dust inhalation may cause an asthma-like disease characterized by coughing and difficult breathing. INGEST: Literature reports the oral toxicity to be LD Lo=1500 mg/kg (rats). Ingesting cobalt dust can cause vomiting and diarrhea. A sensation of hotness may occur after ingestion of excessive amounts. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Inflammation of the lungs that may be reversible and abnormal tissue growth. INGEST: NAIF.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

CRYSTALLINE QUARTZ: ACUTE: SKIN: NAIF. EYE: Dust can irritate eyes. INHAL: Literature reports the toxicity as LD Lo=16 MPPCF (Inhalation Mamsters). Cough, shortness of breath, wheezing and repeated non-specific chest illnesses. INGEST: Chemically and biologically inert when ingested. CHRONIC: SKIN: NAIF. EYE: Abnormal tissue growth in the eyes. INHAL: Chronic exposure to crystalline silica dust may cause progressive lung disease (Silicosis). INGEST: NAIF.

PHENOLIC (CURED RESIN): ACUTE: SKIN: NAIF. EYE: NAIF. INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

CURED RESIN (EPOXY): ACUTE: SKIN: Can cause skin irritation (Dermatitis). EYE: Irritating to the eyes. INHAL: Irritating to the respiratory tract. INGEST: Epoxy oligomers and final resins have low oral toxicities. Literature reports the LD 50-2 19 gm/kg (Rats). Lethal dose in rats depresses the respiratory system. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

GLASS, FIBROUS OR DUST: ACUTE: SKIN: May cause skin irritation. EYE: May cause eye irritation. INHAL: May irritate the upper respiratory tract. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Fibers smaller than 3.5 u m. have the ability to penetrate to the air cells of the lung. INGEST: NAIF.

PURFURAL: ACUTE: SKIN: Vapors are irritating to the skin. EYE: Vapors are irritating to the eyes. INHAL: Irritating to the mucous membranes of the upper respiratory tract. Headache, fatigue, itching of the throat, loss of the sense of taste, numbness of the tongue, and tremor. INGEST: NAIF. CHRONIC: SKIN: Irritation (dermatitis) as well as skin sensitization, resulting in allergic contact dermatitis and photosensitivity may develop. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

IRON OXIDE: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: The inhalation of fumes or dust may cause an apparent benign lung disease which is called siderosis. This disease is reported not to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible. INGEST: NAIF.

GRAPHITE: ACUTE: SKIN: May cause irritation. EYE: May cause irritation and swelling. INHAL: May cause irritation to the nose or throat (Bronchitis). INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: As graphite. May produce a progressive and disabling lung disease. Symptoms include headache, coughing, depression, decreased appetite, difficult breathing and the production of black sputum. Individuals may be free of symptoms for many years and then suddenly become disabled. INGEST: NAIF.

MANGANESE: ACUTE: SKIN: NAIF. EYE: May cause slight eye irritation. INHAL: Can cause bronchitis and inflammation of lung. Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. Freshly formed fumes can cause fever and chills similar to the flu. INGEST: Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Manganese poisoning is not fatal but may present a large range of nervous system disorders that vary among individuals. Advanced symptoms are similar to classical Parkinson's disease.

MOLYBDENUM: ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: Inhalation of the dust or fumes of this metal can cause upper respiratory system irritation. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Literature reports experiments with animals have shown cumulative liver and kidney damage (fatty changes) and blood disorders. INGEST: High dietary intake of molybdenum has been reported to be associated with a gout-like disease and high blood uric acid.

NICKEL: ACUTE: SKIN: NAIF. EYE: Causes eye irritation. INHAL: Nickel is an irritant to the mucous membrane of the upper respiratory tract. INGEST: Literature reports nickel soluble salts are quite toxic and if swallowed may cause giddiness and nausea. CHRONIC: SKIN: Skin sensitization resulting in chronic eczema "Nickel itch". EYE: NAIF. INHAL: Elemental nickel (as deposited from inhalation of nickel carbonyl) and nickel salts may cause cancer (producing an increased incidence of cancer of the lung and nasal passages). Effects on the heart muscle, brain, liver, and kidney have been seen in animal studies. INGEST: NAIF.

PHOSPHOROUS: ACUTE: SKIN: May result in severe burns. EYE: May cause severe irritation or burns. INHAL: Shock may ensue rapidly. INGEST: Literature reports the oral toxicity as LD 50+3030 u gm/kg. Shock may ensue rapidly. CHRONIC: SKIN: Systemic poisoning may follow skin burns. Can cause death of tissue of the jaw. EYE: NAIF. INHAL/INGEST: Systemic poisoning. Can affect the function or cause failure of the liver, kidney, heart or blood vessels.

SILICON: ACUTE: SKIN: Physical damage to the skin caused by dust or by cleaning procedures used to remove it. EYE: Dust may irritate eyes. INHAL: Dust may cause physical damage to the mucous membranes or nasal passages. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May produce x-ray changes in the lungs without disability. INGEST: NAIF.

SILICON CARBIDE: ACUTE: SKIN: Dust may irritate skin. EYE: Dust may irritate eyes. INHAL: Nuisance particulate. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Progressive lung disease. INGEST: NAIF.

SILVER: ACUTE: SKIN: Small particles of silver can implant in the skin and cause permanent discoloration. EYE: Silver particles can cause permanent discoloration of the eyes causing them to appear blue gray. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Inhaling or ingesting silver can cause bluish discoloration of the skin and mucous membranes. May cause permanent coloration of the skin and eyes. Silver accumulates after it enters the body.

SODIUM FLUOALUMINATE: ACUTE: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: Acute toxicity by ingestion is known to be very low. Literature reports the toxicity as LD50=200 mg/kg (Oral Rats). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Changes in skeleton noted on X-rays. INGEST: NAIF.

TIN: ACUTE: SKIN: May cause skin irritation. EYE: May irritate eyes. INHAL: May irritate the mucous membranes. INGEST: Literature reports the toxicity is low. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Exposure to the dust or fumes of tin oxide can result in a benign lung disease called stannosis. No tissue reaction or breathing disorder has been associated with this lung condition. INGEST: NAIF.

TUNGSTEN CARBIDE: ACUTE: SKIN: May cause skin sensitization and irritation. EYE: May cause eye irritation. INHAL: May cause temporary or permanent lung damage or affect the central nervous system. INGEST: May affect the stomach, intestine and central nervous system. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Permanent lung damage. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention. **EYE CONTACT:** Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Brush off excess dust. Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES. NORMAL STORAGE AND HANDLING: No special procedures required. NORMAL USE: No special procedures required. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Treat chips or dust as metal alloys. WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION. RESPIRATORY PROTECTION: If conditions of use (Dry Honing, cutting, or grinding of stone) give rise to dust use NIOSH approved respirator rated for metal dust to maintain levels of dust below ACGIH TLV and OSHA PEL/TLV levels. VENTILATION: If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering of stone) give rise to metal fumes use forced ventilation to maintain levels of fumes below ACGIH TLV and OSHA PEL/TLV levels. SKIN PROTECTION: Not required. EYE PROTECTION: Always wear NIOSH approved safety glasses when honing or operating machinery. OTHER EQUIPMENT: No applicable information found. MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Remove traces of material dust if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA. Material in the solid state does not present a fire or explosion hazard. Dust hazards exist under favoring conditions of small particle size. Dispersion in air and strong ignition source may result in an explosion.

NOTICE

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THIS MSDS IS OFFERED SOLELY TO COMPLY WITH THE RULE AND IS NOT INTENDED TO CREATE ANY LIABILITY OF ANY KIND ON THE PART OF SUNNEN PRODUCTS COMPANY ("SUNNEN"). IN NO EVENT WILL SUNNEN BE RESPONSIBLE FOR ANY DEATH, INJURY OR DAMAGE OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF, RELIANCE UPON, OR MISE OF THE MSDS. NO REPRESENTATIONS OR WARRANTIES, WHETHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER NATURE, ARE MADE HEREUNDER. THIS MSDS IS NOT INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR EXTEND LICENSES UNDER VALID PATENTS.

THIS MSDS IS FURNISHED UPON THE EXPRESS CONDITION THAT ALL PERSONS RECEIVING IT WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSED PRIOR TO USE. RESPONSIBILITY FOR COMPLIANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS CONCERNING DISSEMINATION OF THE MSDS AND SALE AND USE OF THE MATERIAL TO WHICH IT REFERS RESTS SOLELY UPON THE PURCHASER.

NFPA DESIGNATION 704



MSDS 06

HAZARD RATING	HEALTH	1
4-Extreme		
3-High	FIRE	0
2-Moderate		
1-Slight	REACTIVITY	0
0-Insignificant		
	SPECIFIC HAZARD	NONE

MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY CONTACT: Terry Heller
 ADDRESS: 7910 Manchester Ave. EMERGENCY PHONE NO: 314-781-2105
 St. Louis, Mo. 63143 APPROVED BY: Terry Heller
 United States of America TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen Metal Bond Super Stone: NH, DM, XE11, XD11, XE05, XE13, XE14, XE67 & XG75
 (Example K20-WM45).

CHEMICAL FAMILY: METAL ALLOY. CLASSIFICATION: Machine, Machine Parts. D.O.T. SHIPPING CLASS: Class 85

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL	ACGIH TLV-TWA	CARCINOGENIC
			mg./cu. m.	mg./cu. m.	
IRON	IRON	7439-89-6	10 as Iron Oxide fume	5.0 as Iron Oxide fume	N
COPPER	COPPER	7440-50-8	1.0 / 0.1 fume	1.0 / 0.2 fume	N
COBALT	COBALT	7440-48-4	0.1	.05	N (1)
TIN	TIN	7440-31-5	2.0	2.0 / 2.0 fume	N
SILVER	SILVER	7440-22-4	.01	0.1	N
DIAMOND	CARBON	7440-44-0	3.5 as Carbon Black	3.5 as Carbon Black	N
MANGANESE	MANGANESE	7439-96-5	5.0	5.0 / 1.0 fume	N
ALUMINUM	ALUMINUM	7429-90-5	NONE	10	N
CHROMIUM	CHROMIUM	7440-47-3	1.0	0.5	N (1)
MOLYBDENUM	MOLYBDENUM	7439-98-7	15	10	N
NICKEL	NICKEL	7440-02-0	1.0	1.0	Y
PHOSPHOROUS	PHOSPHOROUS	7723-14-0	0.1	0.1	N
SILICON	SILICON	7440-21-3	NONE	5 as respirable dust	N
SULFUR	SULFUR	7704-34-9	15 as Sulfur Dioxide	5.0 as Sulfur Dioxide	N
ZINC	ZINC	7440-66-6	5.0 as Zinc Oxide fume	5.0 as Zinc Oxide fume	N

(1) CERTAIN COMPOUNDS OF CHROMIUM AND COBALT HAVE BEEN IDENTIFIED AS SUSPECT HUMAN CARCINOGENS BY I.A.R.C., N.T.P. ANNUAL REPORT. FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----7.8 (APPROX) PERCENT VOLATILE BY WEIGHT-----NOT VOLATILE
 MELTING POINT-----1100-2500 F (593-1371 C) APPROX. VAPOR PRESSURE (mm Hg)-----NOT VOLATILE
 SOLUBILITY IN WATER-----NOT SOLUBLE VAPOR DENSITY (AIR=1)-----NOT VOLATILE
 REACTIVITY IN WATER-----NOT REACTIVE EVAPORATION RATE-----NOT VOLATILE
 APPEARANCE AND ODOR-----SOLID METAL OBJECT. ANTI-RUST COATING HAS ODOR OF KEROSENE.

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Acids, bases or strong oxidizing agents. HAZARDOUS DECOMPOSITION PRODUCTS: Metal fumes if heated. Anti-Rust coating is combustible and will produce oxides of carbon.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES. Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever (flu-like symptoms). Symptoms may be aggravated for sensitive individuals with respiratory conditions (such as emphysema). Persons with light skin, sensitive skin or large amounts of body hair may experience skin disorders from contact with metal fines.

ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

CARBON: ACUTE: SKIN: May cause irritation. EYE: May cause irritation and swelling. INHAL: May cause irritation to the nose or throat (Bronchitis). INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: As graphite. May produce a progressive and disabling lung disease. Symptoms include headache, coughing, depression, decreased appetite, difficult breathing and the production of black sputum. Individuals may be free of symptoms for many years and then suddenly become disabled. INGEST: NAIF.

CHROMIUM: ACUTE: SKIN: Chromium compounds may cause dermatitis. EYE: May cause irritation. INHAL: Dusts of the metal may cause coughing and wheezing, headache, difficult breathing, fever and loss of weight. INGEST: Literature reports the oral toxicity as LD 50=71 mg/kg (Mammals). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: There are reports of a nodular type of breathing disease with impairment of lung function. Some insoluble chromium compounds are suspected carcinogens. INGEST: NAIF.

COBALT: ACUTE: SKIN: Cobalt can cause an allergy. Literature reports very small quantities have caused allergic sensitivity type dermatitis. Eruptions are usually located in the flexure creases of the elbow, knee, ankles, and neck. Cross sensitization can occur between cobalt and nickel and chromium. EYE: May cause irritation. INHAL: Cobalt dust inhalation may cause an asthma-like disease characterized by coughing and difficult breathing. INGEST: Literature reports the oral toxicity to be LD 50=1500 mg/kg (rats). Ingesting cobalt dust can cause vomiting and diarrhea. A sensation of hotness may occur after ingestion of excessive amounts. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Inflammation of the lungs that may be reversible and abnormal tissue growth. INGEST: NAIF.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

IRON: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: The inhalation of iron oxide fumes or dust may cause an apparent benign lung disease which is called siderosis. This disease is reported not to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible. INGEST: NAIF

MANGANESE: ACUTE: SKIN: NAIF. EYE: May cause slight eye irritation. INHAL: Can cause bronchitis and inflammation of lung. Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. Freshly formed fumes can cause fever and chills similar to the flu. INGEST: Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Manganese poisoning is not fatal but may present a large range of nervous system disorders that vary among individuals. Advanced symptoms are similar to classical Parkinson's disease.

MOLYBDENUM: ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: Inhalation of the dust or fumes of this metal can cause upper respiratory system irritation. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Literature reports experiments with animals have shown cumulative liver and kidney damage (fatty changes) and blood disorders. INGEST: High dietary intake of molybdenum has been reported to be associated with a gout-like disease and high blood uric acid.

NICKEL: ACUTE: SKIN: NAIF. EYE: Causes eye irritation. INHAL: Nickel is an irritant to the mucous membrane of the upper respiratory tract. INGEST: Literature reports nickel soluble salts are toxic and if swallowed may cause giddiness and nausea. CHRONIC: SKIN: Skin sensitization resulting in chronic eczema "Nickel itch". EYE: NAIF. INHAL: Elemental nickel (as deposited from inhalation of nickel carbonyl) and nickel salts may cause cancer (producing an increased incidence of cancer of the lung and nasal passages). Effects on the heart muscle, brain, liver, and kidney have been seen in animal studies. INGEST: NAIF.

PHOSPHOROUS: ACUTE: SKIN: May result in severe burns. EYE: May cause severe irritation or burns. INHAL: Shock may ensue rapidly. INGEST: Literature reports the oral toxicity as LD 50-3030 u gm/kg. Shock may ensue rapidly. CHRONIC: SKIN: Systemic poisoning may follow skin burns. Can cause death of tissue of the jaw. EYE: NAIF. INHAL/INGEST: Systemic poisoning. Can affect the function or cause failure of the liver, kidney, heart or blood vessels.

SILICON CARBIDE: ACUTE: SKIN: Dust may irritate skin. EYE: Dust may irritate eyes. INHAL: Nuisance particulate. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Progressive lung disease. INGEST: NAIF.

SILVER: ACUTE: SKIN: Small particles of silver can implant in the skin and cause permanent discoloration. EYE: Silver particles can cause permanent discoloration of the eyes causing them to appear blue gray. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Inhaling or ingesting silver can cause bluish discoloration of the skin and mucous membranes. May cause permanent coloration of the skin and eyes. Silver accumulates after it enters the body.

SULFUR: ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: May cause excessive tissue fluid in the lungs. Gaseous sulfur dioxide is irritating to mucous membranes of the upper respiratory tract. INGEST: Not toxic. Used in medicine as a laxative. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Chronic exposure may result in inflammation of the nose, fatigue, altered sense of smell, and chronic bronchitis. Symptoms are shortness of breath, cough, and increased mucous excretion. Animal experimentation has indicated that sulfur dioxide may be a possible co-carcinogenic agent. INGEST: NAIF.

TIN: ACUTE: SKIN: May cause skin irritation. EYE: May irritate eyes. INHAL: May irritate the mucous membranes. INGEST: Literature reports the toxicity is low. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Exposure to the dust or fumes of tin oxide can result in a benign lung disease called stannosis. No tissue reaction or breathing disorder has been associated with this lung condition. INGEST: NAIF.

ZINC: ACUTE: SKIN: Zinc oxide may produce a dermatitis called "oxide pox" due primarily to clogging of the sweat glands. EYE: NAIF. INHAL: Can cause flu like symptoms beginning four to twelve hours after exposure. Causes sweet or metallic taste in the mouth, dryness and irritation of the throat. Fever and shaking chills then develop. Symptoms last 24 to 48 hours. INGEST: NAIF. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Brush off excess dust. Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES NORMAL STORAGE AND HANDLING: No special procedures
NORMAL USE: No special procedures required. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Treat chips or dust as metal alloys.
WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION RESPIRATORY PROTECTION: If conditions of use (Dry Honing, cutting, or grinding of stone) give rise to dust use NIOSH approved respirator rated for metal dust to maintain levels of dust below ACGIH TLV and OSHA PEL/TLV levels. VENTILATION: If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering of stone) give rise to metal fumes use forced ventilation to maintain levels of fumes below ACGIH TLV and OSHA PEL/TLV levels. SKIN PROTECTION: Not required. EYE PROTECTION: Always wear NIOSH approved safety glasses when honing or operating machinery. OTHER EQUIPMENT: No applicable information found. MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Remove traces of material dust if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA Material in the solid state does not present a fire or explosion hazard. Dust hazards exist under favoring conditions of small particle size. Dispersion in air and strong ignition source may result in an explosion.

NOTICE

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MSDS 07

NTPA DESIGNATION 704

MATERIAL SAFETY DATA SHEET

HAZARD RATING	HEALTH	2
4=Extreme		
3=High	FIRE	4
2=Moderate		
1=Slight	REACTIVITY	1
0=Insignificant		
	SPECIFIC HAZARD	NONE

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
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 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen Spray Paint LBB-90438 or MBB-90437
 CHEMICAL FAMILY: AEROSOLS, PAINT
 CLASSIFICATION- SHIPPING NAME: Compressed Gas N.O.S., HAZARD CLASS: Flammable gas, DOT SHIPPING CLASS: ORM-D, ID Number: UN1954

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO.	OSHA PEL	ACGIH TLV-TWA	CARCINOGENIC
PAINT					
KYLOK	XYLENE	1330-20-7	100 PPM	100 PPM	NO
N-BUTYL ACETATE	ACETIC ACID, BUTYL ESTER	123-86-4	150 PPM	150 PPM	NO
TOLUOL/LACOLENE	TOLUENE	108-88-3	200 PPM	100 PPM	NO
ISOPROPYL ALCOHOL	ISOPROPYL ALCOHOL	67-63-0	400 PPM	400 PPM	NO
METHYL ETHYL KETONE	2-BUTANONE	78-93-3	200 PPM	200 PPM	NO
BUTYL CELLOSOLVE	ETHANOL, 2-BUTOXY	111-76-2	50 PPM (skin)	25 PPM (skin)	NO
N-BUTANOL	BUTYL ALCOHOL	71-36-3	100 PPM	50 PPM (skin ceiling)	NO
METHYL ISOBUTYL KETONE	2-PENTANONE, 4-METHYL	108-10-1	100 PPM	50 PPM	NO
TITANIUM DIOXIDE	TITANIUM DIOXIDE	13463-67-7	15 mg/m cu	10 mg/m cu (dust)	NO
LEAD CHROMATE (1)	LEAD CHROMATE (1)	12656-85-8	.05 mg/m cu	.05 mg/m cu	NO*
IRON OXIDE (2)	IRON OXIDE (2)	1309-37-1	10 mg/m cu (fume)	5 mg/m cu (fume)	NO
SOLVENT/PROPELLANT					
ACETONE	ACETONE	67-64-1	750 PPM	750 PPM	NO
DIACETONE ALCOHOL	DIACETONE ALCOHOL	123-42-2	50 PPM	50 PPM	NO
ISOBUTANE	2-METHYL-PROPANE	75-28-5	800 PPM	800 PPM	NO
PROPANE	PROPANE	74-98-6	1000 PPM	NAIF	NO
N-BUTANE	N-BUTANE	106-97-8	NAIF	NAIF	NO

PPM=Parts per Million. NAIF=No applicable information found. (1) LBB-90438 only. (2) MBB-90437 only.

* ACGIH lists Lead Chromate as "suspect of carcinogenic potential for man."

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1):-- NAIF	SOLUBILITY IN WATER:----- < .1% @ 77 F (25C)
REACTIVITY IN WATER:----- NOT REACTIVE	APPEARANCE AND ODOR:----- COLORED LIQUID WITH ODOR OF SOLVENT.
BOILING POINT:----- < 0 degrees F (< -18 C)	PERCENT VOLATILE BY VOLUME:-- 91%
VAPOR PRESSURE (mm Hg):----- NAIF	VAPOR DENSITY (AIR=1):----- HEAVIER THAN AIR.
EVAPORATION RATE:----- RELATIVE TO BUTYL ACETATE OR ETHER:	Propellant is faster. Solvent is slower.
	Residual material is non-volatile.

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: Do not store near fire or flame or where temperature exceeds 120 F (50 C). OTHER: Do not smoke when in use or when fumes are present. Use with positive ventilation.

SECTION 5 CORROSIVITY AND REACTIVITY DATA STABILITY: Material is stable. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (materials to avoid): Peroxides or strong oxidizing agents such as chlorine, permanganates, and dichromates. DECOMPOSITION PRODUCTS: Combustion of material will produce oxides of carbon, lead and nitrogen.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA.

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE.

Primary routes of entry are inhalation, skin and eye contact. Vapors are anesthetic, irritate the respiratory tract and depress the nervous system. Symptoms include: drowsiness, headaches, dizziness, unconsciousness and coma. Repeated overexposure to solvents is reported to cause permanent damage to skin, eyes, nose, mucous membranes, lungs, thorax, liver, kidneys, brain and central nervous system. Individuals with existing respiratory impairment such as emphysema, may display an increased sensitivity to solvent vapors. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=No applicable information found. SKIN=Skin absorption. EYE=Eye contact. INHAL=Inhalation. INGEST=Ingestion

ACETIC ACID, BUTYL ESTER (N-BUTYL ACETATE) ACUTE: SKIN: Causes irritation of skin. Nonspecific drying, cracking and increased susceptibility to infection. EYE: Causes eye irritation. INHAL: Causes irritation of upper respiratory system. Headache, drowsiness and drunkenness at high concentration. Affects central nervous system. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Kidney and blood changes in experimental animals. Affects lungs, thorax and breathing. INGEST: NAIF.

ACETONE: ACUTE SKIN: Skin irritation. Dermatitis. EYE: Liquid or vapors may irritate eyes. INHAL: Irritation of nose and throat. Headaches and dizziness. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. INGEST: NAIF

N-BUTANE: ACUTE: SKIN: Frostbite. EYE: Frostbite may damage eyes. INHAL: Drunkenness. Asphyxiant. INGEST: A gas under normal atmospheric conditions is unlikely to be ingested. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

2-BUTANONE (METHYL ETHYL KETONE): ACUTE: SKIN: Causes skin irritation. EYE: Causes eye irritation. INHAL: Attacks central nervous system and lungs. Irritation of nose and respiratory tract. Symptoms include headache, dizziness and vomiting. INGEST: Expected to be non-toxic based on literature reports that the LD50=2737 mg/kg (rats). Enhances toxicity of n-butyl ketone. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

BUTYL ALCOHOL (N-BUTANOL): ACUTE: SKIN: Causes skin irritation and dermatitis. EYE: Causes irritation and inflammation. INHAL: Irritates the nose and eyes. Affects lungs, thorax and breathing. INGEST: Expected to be non-toxic based on literature reports that the LD50=700 mg/kg (rats). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

DIACETONE ALCOHOL: ACUTE: SKIN: Causes skin irritation. EYE: Eye irritation and tissue damage. INHAL: Irritation of nose and throat. Drunkenness. INGEST: Drunkenness. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: Bizarre symptoms may result from the denaturants present in industrial alcohols.

ETHANOL, 2-BUTOXY (BUTYL CELLOSOLVE): ACUTE: SKIN: Penetrates intact skin. Depresses central nervous system. Kidney injury and blood in the urine. Expected to be toxic by skin absorption based on literature reports that the LD50=490 mg/kg (rabbits). EYE: Causes eye irritation. INHAL: Causes behavioral changes, headaches. INGEST: Expected to be non-toxic based on literature reports that the LD50=1480 mg/kg (rats). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: Affects liver, kidneys and lymphoid system. Causes destruction of red blood cells and blood in urine.

IRON OXIDE: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: The inhalation of fumes or dust may cause an apparent benign lung disease which is called siderosis. This disease is reported not to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible. INGEST: NAIF.

ISOPROPYL ALCOHOL: ACUTE: SKIN: May cause mild irritation of skin. EYE: May cause eye irritation. INHAL: Drunkenness at very high concentration based on animal studies. INGEST: Drunkenness. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: Bizarre symptoms may result from the denaturants present in industrial alcohols.

LEAD CHROMATE: ACUTE: SKIN: NAIF. EYE: Causes eye irritation. INHAL: Effects are non-specific. Decreased physical fitness, headache, constipation and stomach pain. Affects central nervous system. Overexposure can cause convulsions, coma and death. INGEST: Classical lead toxicity. Refer to inhalation of lead chromate. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Affects kidney function. Disturbs the blood chemistry. Reduces the number of red blood cells and causes a paleness of the skin. INGEST: Affects the blood, stomach and intestines, nervous and reproductive system. Suspect human carcinogen.

2-METHYL-PROPANE (ISOBUTANE): ACUTE: SKIN: Frostbite. EYE: NAIF. INHAL: An asphyxiant. Vapors affect the central nervous system causing dizziness, disorientation and excitation. INGEST: A gas under normal atmospheric conditions is unlikely to be ingested. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

2-PENTANONE, 4-METHYL (METHYL ISOBUTYL KETONE): ACUTE: SKIN: Causes skin irritation. Dermatitis. EYE: Causes eye irritation. INHAL: Causes irritation of mucous membranes. Attacks central nervous system. Symptoms include muscle weakness, sensory defects, headache, drunkenness and coma. INGEST: Expected to be non-toxic based on literature reports that the LD50=2080mg/kg (rats). CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

PROPANE: ACUTE: SKIN: frostbite. EYE: NAIF. INHAL: An asphyxiant. Vapors affect the central nervous system causing dizziness, disorientation and excitation. INGEST: A gas under normal atmospheric conditions is unlikely to be ingested. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

TITANIUM DIOXIDE: ACUTE: SKIN: NAIF. EYE: May irritate eyes. INHAL: Nuisance Dust. Irritates mucous membranes and lungs. Aggravates existing breathing or respiratory tract impairment. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Can cause abnormal tissue growth in the lungs. INGEST: NAIF.

TOLUENE (TOLUOL, LACOLENE): ACUTE: SKIN: May cause irritation of the skin by drying, producing dermatitis. EYE: May cause reversible eye irritation. INHAL: Attacks liver and kidneys. Can cause central nervous system depression. Symptoms include headache, dizziness, fatigue, incoordination, collapse and coma. INGEST: Expected to be non-toxic based on literature reports that the LD50=5000 mg/kg (rats). CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

XYLENE (XYLOL): ACUTE: SKIN: Defatting agent. Produces drying, redness and blistering. EYE: Can cause irritation. INHAL: Irritant and narcotic. Symptoms include headache, vomiting, drunkenness, loss of consciousness and death. Affects Lungs, Thorax, Kidney and Liver. INGEST: Expected to be non-toxic based on literature reports that the LD50=4300 mg/kg (rats). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Causes liver impairment, kidney failure and hemorrhages in the brain. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.

EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES NORMAL STORAGE AND HANDLING: Store in well ventilated areas away from sources of ignition as damaged or leaking cans will release propellant which is highly flammable, heavier than air and may travel long distances to a source of ignition and flash back causing the container to burn or explode. post areas "no smoking or open flames." Do not store at temperatures above 120 F (49 C) or in direct sunlight as can may overheat and burst releasing the highly flammable propellant. Cool overheated cans if possible. Do not store near oxidizing agents. Keep out of the reach of children. NORMAL USE: Use only with adequate ventilation, ensuring fresh air entry during use as breathing vapors can cause dizziness, unconsciousness or coma. If eye watering, headache or dizziness is experienced, increase ventilation or seek fresh air. Vapors will accumulate readily and are potentially explosive. Use only around explosion proof equipment. Do not spray near sparks, heat or open flame as propellant may ignite creating a fire hazard. Wear protective goggles if mist is present or if any possibility of eye contact exists. Wear NIOSH approved respirator if vapors approach TLV. DO not drop container as it may dent or use a deformed container. A deformed container has reduced expansion space and may develop dangerous pressure causing it to burst in a violent manner. Do not puncture can. Wash hands after using. Intentional misuse by deliberately concentrating and inhaling the contents of the aerosol can be harmful or fatal. Do not take internally. Do not smoke when spraying or if vapors are present. Read and observe cautions and warnings on container label. **STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS:** If a can develops a leak, move it outside or to a well ventilated area immediately to prevent accumulation of the flammable propellant which is potentially explosive. If leaking containers are found in a storage area eliminate all ignition sources. Ventilate to reduce and remove the propellant fire hazards before entering or using equipment in these areas. Absorb liquid with inert material using non-sparking tools. Vapor levels exceeding TLV may be present. **WASTE DISPOSAL METHODS:** Do not incinerate as container may explode. Do not discard in compactor as contents may be released in a dangerous manner resulting in fire or explosion. Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. Use approved air-purifying respirator to remove solid airborne particles of overspray during spray application. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive pressure self-container breathing apparatus. VENTILATION: Ensure fresh air entry during use. If TLV levels are approached or any discomfort is experienced provide positive mechanical ventilation. PROTECTIVE GLOVES: Use to prevent prolonged or repeated skin contact. EYE PROTECTION: Wear protective goggles to prevent eye contact.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA FLASH POINT= -25 F (-32 C). Method used: T.O.C. FLAMMABLE LIMITS IN AIR (% BY VOLUME): LEL (lower)=0.9 UEL (upper)=12.8 EXTINGUISHING MEDIA: foam, carbon dioxide, dry chemical or water fog. SPECIAL FIRE FIGHTING PROCEDURES: Wear positive pressure, self-contained respiratory equipment. Exposure to temperature above 120 F may cause the container to burst, releasing the highly flammable propellant. Water spray used to cool the containers during fire conditions may help prevent rupture. UNUSUAL FIRE AND EXPLOSION HAZARDS: Treat as cylinders of compressed flammable gas. Propellant vapors are heavier than air. In case of rupture, ventilate as to prevent concentrations from reaching flammable levels. Decomposition and combustion products may be toxic.

NOTICE

THIS MATERIAL SAFETY DATA SHEET ("MSDS") IS SUPPLIED PURSUANT TO THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S HAZARD COMMUNICATION RULE (THE "RULE"), 29 CFR 1910.1200. THIS MSDS IS BEING FURNISHED TO THE IMMEDIATE PURCHASER OF THE MATERIAL TO WHICH IT REFERS WITHOUT REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS OR ACCURACY OF ANY INFORMATION OR RECOMMENDATIONS CONTAINED HEREIN.

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THIS MSDS IS FURNISHED UPON THE EXPRESS CONDITION THAT ALL PERSONS RECEIVING IT WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSED PRIOR TO USE. RESPONSIBILITY FOR COMPLIANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS CONCERNING DISSEMINATION OF THE MSDS AND SALE AND USE OF THE MATERIAL TO WHICH IT REFERS RESTS SOLELY UPON THE PURCHASER.

MFPA DESIGNATION 704

HAZARD RATING	HEALTH	3
4=Extreme		
3=High	FIRE	4
2=Moderate		
1=Slight	REACTIVITY	1
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Meller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Meller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: **Sunnen B200 LUBRICANT**
 CHEMICAL FAMILY: MIXTURE OF CHLORINATED HYDROCARBONS, ALKANE HYDROCARBONS AND POLYMERIZED PLANT OIL.
 CLASSIFICATION: COMPRESSED GAS N.O.S.
 D.O.T. SHIPPING CLASS: ORM-D

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT %	OSHA PEL	ACGIH TLV-TWA	OTHER	CARCINOGENIC
TRICHLOROETHANE (Stabilized)	1-1-1 TRICHLOROETHANE TERT-BUTYL ALCOHOL 1,2-BUTYLENE OXIDE DIMETHOXYMETHANE	71-55-6 75-65-0 106-688-7 109-87-5	59.5	350 PPM 100 PPM	350 PPM 100 PPM	*40 PPM 1000 PPM	NO
A-55	ISOBUTANE PROPANE	68476-8608	30	NONE 1000 PPM	800 PPM NONE	**860 PPM	NO
TALL OIL POLYMER		70900-00-4	10.5	NONE	NONE		NO

PPM=Parts per Million. * DOW INDUSTRIAL HYGIENE GUIDE, DOW CHEMICAL COMPANY ** CALCULATED

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)----- 1.041 CALCULATED
 BOILING POINT----- -43.7 F (-42 C) PROPELLANT
 165 F (74 C) LUBRICANT MIXTURE
 PERCENT VOLATILE BY WEIGHT----- 89%
 VAPOR PRESSURE (mm Hg)----- 42 PSIG @ 68 F (20C)
 VAPOR DENSITY (AIR=1)----- 2.871 ESTIMATED
 EVAPORATION RATE----- FASTER THAN BUTYL ACETATE (Propellant/Solvent). Residual product is non-volatile.
 SOLUBILITY IN WATER----- < .1% @ 77 F (25C)
 SOLUBILITY IN WATER----- NOT REACTIVE
 APPEARANCE AND ODOR----- AMBER COLOR LIQUID WITH ODOR OF CHLORINATED SOLVENT

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: DO NOT STORE NEAR FIRE OR FLAME OR WHERE TEMPERATURE EXCEEDS 120 F (50 C).
 OTHER: DO NOT SMOKE WHEN FUMES ARE PRESENT. USE WITH POSITIVE VENTILATION.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY: PEROXIDES OR STRONG OXIDIZING AGENTS SUCH AS CHLORINE, PERMANGANATES, AND DICHROMATES.
 (materials to avoid)
 DECOMPOSITION PRODUCTS: COMBUSTION OF MATERIAL WILL PRODUCE OXIDES OF CARBON, NITROGEN AND OTHER PRODUCTS OF COMBUSTION. MAY PRODUCE TOXIC OR CORROSIVE FUMES SUCH AS HYDROGEN CHLORIDE AND SMALL AMOUNTS OF PHOSGENE AND CHLORINE WHEN HEATED TO DECOMPOSITION AS IN WELDING OR FIRE.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY	ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE	FIRST AID AND MEDICAL INFORMATION
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INHALATION THE PROPELLANT (A55) IS AN ASPHYXIAN. THE SOLVENT (1-1-1 TRICHLOROETHANE) ACTS AS AN ANESTHETIC, CAUSES IRRITATION OF THE RESPIRATORY TRACT OR ACUTE NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY THE FOLLOWING PROGRESSIVE STEPS: EYE WATERING, HEADACHE, DIZZINESS, STAGGERING GAIT, CONFUSION, CARDIAC ARRHYTHMIAS (IRREGULAR HEARTBEATS), UNCONSCIOUSNESS, COMA AND DEATH. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL. BASED ON AVAILABLE DATA, REPEATED EXPOSURES ARE NOT ANTICIPATED TO CAUSE ANY SIGNIFICANT ADVERSE EFFECTS. 1-1-1 TRICHLOROETHANE AND SIMILAR MIXTURES DID NOT CAUSE CANCER IN LONG TERM ANIMAL STUDIES. BIRTH DEFECTS ARE UNLIKELY. EXPOSURES HAVING NO ADVERSE EFFECTS ON THE MOTHER SHOULD HAVE NO EFFECT ON THE FETUS. IN ANIMAL STUDIES, HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION. RESULTS OF IN VITRO ("TEST TUBE") MUTAGENICITY TESTS ON 1-1-1 TRICHLOROETHANE HAVE BEEN NEGATIVE. RESULTS OF MUTAGENICITY TESTS IN ANIMALS HAVE BEEN NEGATIVE.

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE MOUTH TO MOUTH RESUSCITATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. SEEK MEDICAL ATTENTION.

INGESTION THE PROPELLANT IS A GAS UNDER NORMAL ATMOSPHERIC CONDITIONS AND IS THEREFORE UNLIKELY TO BE INGESTED. THE SINGLE DOSE ORAL TOXICITY FOR THE SOLVENT AND LUBRICANT IS LOW. THE LD50 FOR RATS IS >10,000 mg/kg FOR 1-1-1 TRICHLOROETHANE. IF ASPIRATED (LIQUID ENTERS THE LUNG), IT MAY BE RAPIDLY ABSORBED THROUGH THE LUNGS AND RESULT IN INJURY TO OTHER BODY SYSTEMS.

DO NOT INDUCE VOMITING. CALL A PHYSICIAN AND/OR TRANSPORT TO EMERGENCY FACILITY IMMEDIATELY.

NOTE TO PHYSICIAN: BECAUSE RAPID ABSORPTION MAY OCCUR THROUGH LUNGS IF ASPIRATED AND CAUSE SYSTEMIC EFFECTS, THE DECISION OF WHETHER TO INDUCE VOMITING OR NOT SHOULD BE MADE BY AN ATTENDING PHYSICIAN. IF LAVAGE IS PERFORMED, SUGGEST ENDOTRACHEAL AND/OR ESOPHAGEAL CONTROL. DANGER FROM LUNG ASPIRATION MUST BE WEIGHED AGAINST TOXICITY WHEN CONSIDERING EMPTYING THE STOMACH. EXPOSURE MAY INCREASE "MYOCARDIAL IRRITABILITY". DO NOT ADMINISTER SYMPTOMATIC DRUGS UNLESS ABSOLUTELY NECESSARY. NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE. TREATMENT BASED ON JUDGMENT OF THE PHYSICIAN IN RESPONSE TO REACTIONS OF THE PATIENT.

SKIN CONTACT PRIMARY IRRITANT. THE LD50 FOR RABBITS IS ABOUT 15,000 mg/kg FOR 1-1-1 TRICHLOROETHANE. PROLONGED OR REPEATED CONTACT MAY CAUSE DRYING OR FLAKING OF THE SKIN.

WASH HANDS WITH MILD NON-ABRASIVE SOAP AND WATER. IF IRRITATION DEVELOPS, SEEK MEDICAL ATTENTION.

EYE MAY CAUSE PAIN. MAY CAUSE SLIGHT TRANSIENT (TEMPORARY) IRRITATION WITH SLIGHT TRANSIENT CORNEAL INJURY. VAPORS MAY IRRITATE EYES.

REMOVE CONTACT LENSES (IF WEARING) AND FLUSH EYES WITH WATER FOR 15 MINUTES. SEEK MEDICAL ATTENTION.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: STORE IN WELL VENTILATED AREAS AWAY FROM SOURCES OF IGNITION AS DAMAGED OR LEAKING CANS WILL

RELEASE PROPELLANT WHICH IS HIGHLY FLAMMABLE, HEAVIER THAN AIR AND MAY TRAVEL LONG DISTANCES TO A SOURCE OF IGNITION AND FLASH BACK CAUSING THE CONTAINER TO BURN OR EXPLODE. POST AREAS "NO SMOKING OR OPEN FLAMES". DO NOT STORE AT TEMPERATURES ABOVE 120 F (49 C) OR IN DIRECT SUNLIGHT AS CAN MAY OVERHEAT AND BURST RELEASING THE HIGHLY FLAMMABLE PROPELLANT. COOL OVERHEATED CANS IF POSSIBLE. DO NOT STORE NEAR OXIDIZING AGENTS. KEEP OUT OF THE REACH OF CHILDREN.

NORMAL USE:

USE ONLY WITH ADEQUATE VENTILATION, ENSURING FRESH AIR ENTRY DURING USE AS BREATHING VAPORS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS OR COMA. IF EYE WATERING, HEADACHE OR DIZZINESS IS EXPERIENCED, INCREASE VENTILATION OR SEEK FRESH AIR. VAPORS WILL ACCUMULATE READILY AND ARE POTENTIALLY EXPLOSIVE. DO NOT SPRAY NEAR SPARKS, HEAT OR OPEN FLAME AS PROPELLANT MAY IGNITE CREATING A FIRE HAZARD. CONTACT OF SPRAY OR FUMES WITH HOT SURFACES SUCH AS CIGARETTES, HOT PLATE, FURNACE OR FLAME MAY RELEASE HYDROGEN CHLORIDE, CHLORINE OR PHOSGENE GAS THAT IS TOXIC AND CORROSIVE. DO NOT SMOKE WHILE SPRAYING AS TOXIC GASES ARE FORMED AS FUMES PASS THRU THE LIT CIGARETTE. WEAR PROTECTIVE GOGGLES IF MIST IS PRESENT OR IF ANY POSSIBILITY OF EYE CONTACT EXISTS. WEAR NIOSH APPROVED RESPIRATOR IF VAPORS APPROACH TLV. DO NOT DROP CONTAINER AS IT MAY DENT OR USE A DEFORMED CONTAINER. A DEFORMED CONTAINER HAS REDUCED EXPANSION SPACE AND MAY DEVELOP DANGEROUS PRESSURE CAUSING IT TO BURST IN A VIOLENT MANNER. WASH HANDS AFTER USING.

**STEPS TO BE TAKEN
IN CASE OF LEAKS
OR SPILLS**

IF A CAN DEVELOPS A LEAK, MOVE IT OUTSIDE OR TO A WELL VENTILATED AREA IMMEDIATELY TO PREVENT ACCUMULATION OF THE FLAMMABLE PROPELLANT WHICH IS POTENTIALLY EXPLOSIVE. IF LEAKING CONTAINERS ARE FOUND IN A STORAGE AREA ELIMINATE ALL IGNITION SOURCES. VENTILATE TO REDUCE AND REMOVE THE PROPELLANT FIRE HAZARDS BEFORE ENTERING OR USING EQUIPMENT IN THESE AREAS. ABSORB LIQUID WITH INERT MATERIAL. VAPOR LEVELS EXCEEDING TLV MAY BE PRESENT.

WASTE DISPOSAL METHODS:

DO NOT INCINERATE AS CONTAINER MAY EXPLODE. DO NOT DISCARD IN COMPACTOR AS CONTENTS MAY BE RELEASED IN A DANGEROUS MANNER RESULTING IN FIRE OR EXPLOSION. DISPOSE OF IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, RULES, ORDERS AND ORDINANCES.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: ATMOSPHERIC LEVELS SHOULD BE MAINTAINED BELOW THE EXPOSURE GUIDELINES. WHEN RESPIRATORY PROTECTION IS REQUIRED FOR CERTAIN OPERATIONS, USE AN APPROVED AIR-PURIFYING RESPIRATOR. FOR EMERGENCY AND OTHER CONDITIONS WHERE THE EXPOSURE GUIDELINE MAY BE GREATLY EXCEEDED, USE AN APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS.

VENTILATION: ENSURE FRESH AIR ENTRY DURING USE. IF TLV LEVELS ARE APPROACHED OR ANY DISCOMFORT IS EXPERIENCED PROVIDE POSITIVE MECHANICAL VENTILATION.

PROTECTIVE GLOVES: IF PREFERRED OR IF SENSITIVITY TO MATERIAL HAS BEEN DEMONSTRATED.

EYE PROTECTION: WEAR PROTECTIVE GOGGLES TO PREVENT EYE CONTACT.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT= PROPELLANT -156 F (-249 C) Method used: ASTM D-92
SOLVENT NONE

FLAMMABLE LIMITS		LEL (lower)	UEL (upper)	Method: ASTM E-681
IN AIR % BY VOLUME	PROPELLANT	1.8%	9.5%	
	SOLVENT	6.0%	16.7%	

EXTINGUISHING MEDIA: FOAM, CARBON DIOXIDE, DRY CHEMICAL, WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES: WEAR POSITIVE PRESSURE, SELF-CONTAINED RESPIRATORY EQUIPMENT. EXPOSURE TO TEMPERATURE ABOVE 120 F MAY CAUSE THE CONTAINER TO BURST, RELEASING THE HIGHLY FLAMMABLE PROPELLANT. WATER SPRAY USED TO COOL THE CONTAINERS DURING FIRE CONDITIONS MAY HELP PREVENT RUPTURE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: TREAT AS CYLINDERS OF COMPRESSED FLAMMABLE GAS. PROPELLANT VAPORS ARE HEAVIER THAN AIR. IN CASE OF RUPTURE, VENTILATE AS TO PREVENT CONCENTRATIONS FROM REACHING FLAMMABLE LEVELS.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: MAN-863 HONING OIL

CHEMICAL FAMILY: NON-PETROLEUM FATTY OIL WITH ADDITIVES AND METAL DEACTIVATOR.
 CLASSIFICATION: NOT APPLICABLE
 D.O.T. SHIPPING CLASS: NOT APPLICABLE

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL	ACGIH TLV-TWA	WT %	CARCINOGENIC
			mg./cu. m.	mg./cu. m.	Range	

WHEN EVALUATED IN ACCORDANCE WITH THE PROVISIONS OF THE FEDERAL HAZARD COMMUNICATION RULE 29 CFR 1910.1200 MAN-852 WAS JUDGED TO BE NON-HAZARDOUS.

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----0.91
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT----->460 F (235 C)
 VAPOR PRESSURE (mm Hg)-----<1mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----Heavier than air.
 EVAPORATION RATE -----Negligible
 SOLUBILITY IN WATER-----Negligible. Material is completely soluble in common hydrocarbon or chlorinated hydrocarbon solvents such as mineral spirits or trichloroethane.
 REACTIVITY IN WATER-----No hazardous reactions.
 APPEARANCE AND ODOR-----Amber color liquid with fatty odor.

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: Store away from heat or flame. Read and follow container warnings. Refer to MSDS Section 7 & 8

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Material is stable under normal conditions of transport and storage.
 POLYMERIZATION: Hazardous polymerization will not occur.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidation agents such as fuming nitric acid. Product may react with any amount of alkali such as part cleaners to form corresponding amounts of soaps and/or emulsions.
 Contains Amines. Do not add sodium nitrite or other nitrosating agents to this material. Suspected cancer-causing nitrosamines could be formed.

CONDITIONS TO BE AVOIDED: Oxidizing conditions. Mixing with water or alkali (forms soaps).

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion of material will produce oxides of Sulfur, Carbon and Nitrogen. Material is organic and will slowly oxidize and decay forming compounds containing Carbonyl group, Hydroxyl group, Carboxyl group, Oxirane, glycerol, hydroperoxides, aldehydes, ketones and acids.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

PRIMARY ROUTE(S) OF ENTRY ARE: INHALATION AND SKIN ABSORPTION. Abbreviations used in the following section: SKIN=Skin absorption. EYE=Eye contact. INHAL=Inhalation INGEST=Ingestion.

ACUTE: SKIN: Material is not sterile and may infect open cuts or sores. When tested, MAN-863 was judged to be non-irritating per 16 CFR 1500.3(c)(4). Primary irritation index=0 (Albino Rabbits). EYE: Overheating (>200 F) used material can release Acrolein (an eye irritant) causing redness and burning of the eyes. When tested, MAN-863 was judged to be non-irritating per 16 CFR 1500.42. No corneal opacity, iritis or moderate conjunctival irritation after; 1,2,3 days (Draize, rabbits). INHAL: Not established. Suggest ACGIH limits for vegetable oil mists of 5 mg/cu m. be observed. Symptoms of overexposure include coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mists or vapors. INGEST: Loose bowel movements. Acute oral toxicity: LD 50>5 gm./kg. (rats). CHRONIC SKIN: Prolonged repeated skin contact can cause skin irritation or oil acne: inflammation and blackheads due to mechanical blockage of the pores. Predisposing factors: Usually individuals with sensitive skin or large amounts of body hair. EYE: None known. INHAL: None known. INGEST: None known.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.

SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. INGESTION: Do not induce vomiting. Call physician or poison control center immediately.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame as the material will expand if overheated and possibly rupture the container spilling the contents. The spilled material will create a slip hazard and will burn if ignited. If stored outdoors, store so as to shed water to prevent rusting of drums and spilling contents. Plastic containers are brittle if frozen and may split and leak if handled roughly. Spilled material creates a fall/slip hazard. Since emptied containers retain material residue, follow label warnings even after container is emptied and do not reuse container for other purposes. Do not cut, braze, weld, solder, pressurize or introduce ignition sources in or around container. Do not transfer to unlabeled containers. For industrial use only. Material should be heated to 100 F and mixed prior to transfer of contents if product separates as a result of cold storage (<50 F). Vent container if heating. Use drum heater for drums. Pails may be immersed in hot water to warm contents. Use personal protection equipment and precautions as specified in Section 8.

NORMAL USE: Material is for use in Honing Machines only. Material may be mixed with other Sunnen Honing Oils only. Clean material from parts using alkaline cleaner. Pollution by any amount of water or alkaline material will lead to the formation of soaps that clog the Honing Machine oil filter.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Contain and absorb on fire-retardant treated sawdust, diatomaceous earth or other suitable absorbent. Notify Coast Guard if spill could reach any waterways (1-800-424-8802) and also local/state authorities. Spilled material is greasy and produces a slip/fall hazard.

WASTE DISPOSAL METHOD: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to mist levels >5 mg/cu m or if operator experiences any respiratory irritation use NIOSH approved respirator rated for use with mineral or vegetable oil mist.

VENTILATION LOCAL: Normal ventilation.

MECHANICAL: Required if use conditions give rise to mist levels greater than 5 mg/cu m or if operator experiences any respiratory or eye irritation.

PROTECTIVE GLOVES: If preferred or if sensitivity to material has been demonstrated use gloves rated for animal or vegetable oil.

EYE PROTECTION: Glasses or goggles to prevent inadvertent splashing of material into eyes. Always wear safety glasses while working around or operating machinery.

OTHER PROTECTION: Apron or barrier cream if desired. Do not wear oil-soaked clothing as it may cause skin irritation or oil acne.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lub oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources by cleaning with caustic cleaners.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----558 F (290 C) ASTM D-92

FLAMMABLE LIMITS IN AIR mg/l @ 24 C & 750 mm Hg. LEL= 68 UEL= 76

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.

AUTO-IGNITION TEMPERATURE: NAIF

UNUSUAL FIRE AND EXPLOSION HAZARDS: Combustion will produce oxides of Carbon, Sulfur and Nitrogen. Sealed containers may leak, burst or explode, releasing contents and spreading fire, if exposed to extreme heat.

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: CK448A GEAR OIL

CHEMICAL FAMILY: PETROLEUM HYDROCARBONS AND ADDITIVES. CLASSIFICATION: PETROLEUM OIL N.O.S.
 D.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID. IDENTIFICATION NUMBER: UM 1270.

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT.%	OSHA PEL	ACGIH TLV-TWA	CARCINOGENIC
				mg./cu. m.	mg./cu. m.	
MINERAL OIL	REFINED MINERAL OIL	NAIF	> 95	5 (mist)	5 (mist)	N
LARD OIL	OILS, LARD	8016-28-2	< 5	NOT ESTABLISHED	NOT ESTABLISHED	N

NAIF=No applicable information found

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----0.904
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT----->600 F (316 C)
 VAPOR PRESSURE (mm Hg)-----<1mm Hg @ 77 F (25 C)
 VAPOR DENSITY (AIR=1)-----HEAVIER THAN AIR
 EVAPORATION RATE-----NEGLECTIBLE
 SOLUBILITY IN WATER-----NEGLECTIBLE. MATERIAL IS COMPLETELY SOLUBLE IN COMMON HYDROCARBON OR CHLORINATED HYDROCARBON SOLVENTS SUCH AS MINERAL SPIRITS OR TRICHLOROETHANE.
 REACTIVITY IN WATER-----NO HAZARDOUS REACTIONS
 APPEARANCE AND ODOR-----DARK GREEN LIQUID.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to Section 7

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDATION AGENTS.
 HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE FROM COMBUSTION.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION.
 ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

ACUTE: Contact with material may cause eye or skin irritation of sensitive individuals.
 ORAL TOXICITY (RATS): LD50>15 gm/kg nontoxic (estimated).--based on testing of similar products and/or the components.
 DERMAL TOXICITY (RABBITS): LD50>5 gm/kg nontoxic (estimated).--based on testing of similar products and/or the components.
 INHALATION TOXICITY (RATS): No applicable information found.
 EYE IRRITATION (RABBITS): Expected to be non-irritating.--Based on testing of similar products and/or the components.
 SKIN IRRITATION (RABBITS): Expected to be non-irritating.--Based on testing of similar products and/or the components.

CHRONIC: Prolonged or repeated skin contact may cause dermatitis (skin irritation).

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
 EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. SKIN CONTACT: Wash hands with mild non-abrasive soap and water.
 INGESTION: Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water.

NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. Notify Coast Guard if spill could reach any waterway (1-800-424-8802).

WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use a NIOSH approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure to well below TLV levels.

VENTILATION-LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M.
 OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.

OTHER EQUIPMENT: Oil-impervious apron if desired.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----565 F (296 C) ASTM D-92

FLAMMABLE LIMITS--- LEL: 0.6 UEL: 7.0

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/O
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: **PLH-100/101/105 AND
 BP-99 HYDRAULIC OIL**

CHEMICAL FAMILY: PETROLEUM HYDROCARBONS AND ADDITIVES.
 D.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID.

CLASSIFICATION: PETROLEUM OIL N.O.S.
 IDENTIFICATION NUMBER: UN1270

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	Wt. %	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
OIL	REFINED MINERAL OIL	64742-54-7	> 95	5 (mist)	5 (mist)	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----: .87
 PERCENT VOLATILE BY WEIGHT-----: <1%
 BOILING POINT-----: >600 F (316 C)
 VAPOR PRESSURE (mm Hg)-----: <.1mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----: No applicable information found.
 EVAPORATION RATE-----: NEGLIGIBLE
 SOLUBILITY IN WATER-----: NEGLIGIBLE. MATERIAL IS COMPLETELY SOLUBLE IN COMMON HYDROCARBON AND CHLORINATED HYDROCARBON SOLVENTS SUCH AS MINERAL SPIRITS OR TRICHLOROETHANE.
 REACTIVITY IN WATER-----: NOT REACTIVE
 APPEARANCE AND ODOR-----: ASTM 4.0 LIQUID.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZING AGENTS
 HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE FROM COMBUSTION

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION AND SKIN ABSORPTION.
 ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

ACUTE: ORAL TOXICITY (RATS): LD50: > 5 G/KG 0/10 Rats died at this dosage level. Slightly toxic (estimated)---based on testing of similar products and/or the components.
 DERMAL TOXICITY (RABBITS): LD 50: > 2 G/KG 0/10 Rabbits died at this dosage level. Slightly toxic (estimated)---based on testing of similar products and/or the components.
 INHALATION TOXICITY (RATS): Not established. Harmful concentrations of mists and/or vapors are unlikely to be encountered through any customary or reasonably foreseeable handling, use, or misuse of this product.
 EYE IRRITATION (RABBITS): Expected to be non-irritation---Based on testing of similar products and/or the components.
 SKIN IRRITATION (RABBITS): May cause slight irritation on prolonged or repeated contact---Based on testing of similar products and/or the components.

CHRONIC: The base oils in this product are severely solvent refined and/or severely hydrotreated. Two year mouse skin painting studies of similar oils showed no evidence of carcinogenic effects. Severely solvent refined and severely hydrotreated mineral base oils have been tested by dermal application to rats 5 days/week for 90 days at doses significantly higher than those expected during normal industrial exposure. Extensive evaluations including microscopic examination of internal organs and clinical chemistry of body fluids, showed no adverse effects.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. **EYE CONTACT:** Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.
SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. **INGESTION:** Not expected to be a problem. However, if greater than 1/2 liter (Pint) ingested, immediately give 1 to 2 glasses of water and call a physician, hospital emergency room or poison control center for assistance. Do not induce vomiting or give anything by mouth to an unconscious person.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water.

NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Empty drums should be completely drained, properly closed and returned to a drum conditioner to be commercially cleaned. Otherwise, containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. Notify Coast Guard if spill could reach any waterway (1-800-424-8802).

WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use a NIOSH approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure to well below TLV levels.

VENTILATION-LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M.
OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.

OTHER EQUIPMENT: Oil-impervious apron if desired.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----395 F (202 C) ASTM D-92

FLAMMABLE LIMITS--- LEL: 0.6 UEL: 7.0

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters must use recommended protective equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

NOTICE

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NFPA DESIGNATION 704



MATERIAL SAFETY DATA SHEET

HAZARD RATING	HEALTH	0
4-Extreme		
3-High	FIRE	0
2-Moderate		
1-Slight	REACTIVITY	0
0-Insignificant		
	SPECIFIC HAZARD	NONE

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen CRG OR VR Grinding Wheel
 (Example CRG-803 or VR-601).

CHEMICAL FAMILY: Vittrified Abrasive CLASSIFICATION: Not applicable D.O.T. SHIPPING CLASS: Not applicable

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
CRYSTOLON	SILICON CARBIDE	409-21-2	15 Total Dust	10 Total dust	N
ALUNDUM	ALPHA-ALUMINA	1344-28-1	15 Total Dust	10 Total dust	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1) : 3 (APPROX)
 MELTING POINT: NO APPLICABLE INFORMATION FOUND.
 VAPOR DENSITY (AIR=1): NOT VOLATILE
 SOLUBILITY IN WATER: SLIGHT
 APPEARANCE AND ODOR: SOLID MATERIAL. MAY GIVE OFF ODOR IN USE.
 PERCENT VOLATILE BY WEIGHT: NOT VOLATILE
 VAPOR PRESSURE (mm Hg): NOT VOLATILE
 EVAPORATION RATE: NOT VOLATILE
 REACTIVITY IN WATER: NOT REACTIVE

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): Avoid acids of all types with a PH <4.0. HAZARDOUS DECOMPOSITION PRODUCTS: In use, dusts are generated. In most cases, the material removed from the work piece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

USING THE GRINDING WHEEL IN ITS INTENDED MANNER MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES.

PRIMARY ROUTE(S) OF ENTRY ARE: INHALATION, INGESTION, AND SKIN ABSORPTION.

ACUTE:

Dust or fume may leave a metallic taste in the mouth, result in metal fume fever or produce flu like symptoms. Dust may cause irritation to the eyes, skin, nose, or throat. Inhalation of dust during grinding may produce coughing and shortness of breath. Symptoms may be aggravated for sensitive individuals with respiratory conditions such as emphysema. Persons with light skin, sensitive skin or large amounts of body hair may experience increased sensitivity to skin disorders from contact with metal fines. Grinding may create elevated sound levels which may affect hearing.

CHRONIC: Inhalation during grinding may affect breathing capacity and cause permanent lung disease. Prolonged exposure to excessive noise can cause permanent hearing loss.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
 EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation.
 SKIN CONTACT: Brush off excess dust. Wash hands with mild non-abrasive soap and water.
 INGESTION: Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: SEE ANSI STANDARD B7.1
 NORMAL USE: HANDLE WITH ADEQUATE VENTILATION. SEE OSHA 29 CFR 1910.94 (VENTILATION) AND 29 CFR 1910.1000 (AIR CONTAMINATES).
 STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Normal cleanup procedures.
 WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: None required under normal conditions of use with adequate ventilation. If dust levels approach TLV use a NIOSH approved respirator or forced ventilation to maintain dust levels below ACGIH/OSHA TLV/PEL levels. See OSHA 29 CFR 1910.134.
 VENTILATION LOCAL: Recommended. MECHANICAL: Recommended.
 SKIN PROTECTION: Not required.
 EYE PROTECTION: Always wear NIOSH approved safety glasses when operating machinery. See OSHA 29 CFR 1910.133.
 OTHER EQUIPMENT: Hearing protection if noise levels exceed NIOSH/OSHA TLV/PEL levels. See OSHA 29 CFR 1910.215.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

No hazard. Not combustible in air.

NOTICE

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NFPA DESIGNATION 704



HAZARD RATING - HEALTH 1 -
 4=Extreme
 3=High
 2=Moderate
 1=Slight
 0=Insignificant

- FIRE 0 -
 - REACTIVITY 0 -
 - SPECIFIC HAZARD NONE -

MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314 781 2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: MS-1101G, SCC-100 or SCC-101 COOLANT
 CHEMICAL FAMILY: CHEMICAL MIXTURE CLASSIFICATION: NOT APPLICABLE D.O.T. SHIPPING CLASS: NOT APPLICABLE

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO.	WT. %	OSHA PEL	ACGIH TLV-TWA	CARCINOGENIC
				mg./cu. m.	mg./cu. m.	

This product has been determined to be nonhazardous, in accordance with 29 CFR 1910.1200 (d) (Hazard Determination).

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1): 0.996
 BOILING POINT: 212 F (100 C)
 EVAPORATION RATE: Like water
 SOLUBILITY IN WATER: 100%
 APPEARANCE AND ODOR: Clear; burgundy

PERCENT VOLATILE BY WEIGHT: No applicable information found.
 VAPOR DENSITY (AIR=1): No applicable information found.
 VAPOR PRESSURE (mm Hg): No applicable information found.
 REACTIVITY IN WATER: NOT REACTIVE

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): AVOID CONTACT OF CONCENTRATE WITH STRONG ACIDS. CONTAINS AMINES. DO NOT ADD SODIUM NITRITE OR OTHER NITROSATING AGENTS TO THIS MATERIAL. SUSPECTED CANCER-CAUSING NITROSAMINES COULD BE FORMED.
 HAZARDOUS DECOMPOSITION PRODUCTS: NO APPLICABLE INFORMATION FOUND.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION.
 ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

ACUTE: ORAL TOXICITY (LD50 RATS): Above 5 g/kg (Undiluted) Non-toxic.
 INHALATION TOXICITY (LC50 RATS): Above 20 mg/l for a 10% mix.
 EYE IRRITATION (RABBITS): Negative (Undiluted); no irritative or corrosive effects.
 SKIN IRRITATION (RABBITS): Negative (Undiluted); noncorrosive and not a primary skin irritant.
 DERMAL TOXICITY (LD50 RABBITS): Above 2 g/kg (Undiluted)
 BACTERIAL MUTAGENIC (AMES) TEST: Non-mutagenic.

This product is not a primary skin irritant; however, skin irritation may occur if used improperly (concentrate or mix). May

aggravate existing skin irritation where further defatting or skin penetration could occur.

CHRONIC: No applicable information found.

EMERGENCY FIRST AID

INITIATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.
 SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. INGESTION: Do not induce vomiting. Dilute with water or milk. Immediately contact physician and obtain treatment.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store under ordinary conditions. If stored outdoors, store so as to shed water. Protect from freezing. NORMAL USE: Use only as recommended. Avoid all contact of concentrate with eyes or prolonged contact with skin. Avoid wearing clothing soaked with fluid. Do not swallow. Practice good personal hygiene by washing hands several times each day. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to burst, potentially causing serious injury or death. Do not attempt to clean as residue is difficult to remove. Containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Thoroughly flush with water to sewer. WASTE DISPOSAL METHODS: FOR USED MIX: 1) Ultrafiltration for sewer disposal, or 2) recycle equipment for reuse, or 3) treat with polymer or inorganic demulsifiers, then dispose of top layer by incineration or landfill, and dispose of water layer in sanitary sewer. FOR UNUSED CONCENTRATE: Incinerate, or contact vendor. Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Product is not volatile. SKIN PROTECTION: Waterproof gloves required when handling concentrate. EYE PROTECTION: Safety shield or goggles required when handling concentrate. Always wear safety glasses while operating machinery. VENTILATION-LOCAL: Normal MECHANICAL: No applicable information found. OTHER: No applicable information found. OTHER EQUIPMENT: Effective metalworking plant protective clothing as appropriate.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None. Self-extinguishing. FLAMMABLE LIMITS: LEL: UNKNOWN UEL: UNKNOWN
 EXTINGUISHING MEDIA: No fire hazard. SPECIAL FIRE FIGHTING PROCEDURES: None
 UNUSUAL FIRE AND EXPLOSION HAZARDS: None

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	1
4=Extreme		
3=High	FIRE	0
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE

MATERIAL SAFETY DATA SHEET

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY CONTACT: Terry Heller
 ADDRESS: 7910 Manchester Ave. EMERGENCY PHONE NO: 314-781-2105
 St. Louis, Mo. 63143 APPROVED BY: Terry Heller
 United States of America TITLE: Manager, Materials R/D
 DATE: August 15, 198

TRADE NAME, COMMON NAME OR SPECIFICATION: Diamond Plated Guide Shoe with D or DX suffix (Example VB-BD or UA-B-7520X).
 Single Stroke Honing Unit (Example A16A-437S) or Diamond Valve Seating Wheel (Example VS-2250-45-D5) or Diamond Honing Tool
 (Example VG-344-D5) or Super Mandrel with D or DX suffix (Example K6-185CSD or K6-189CSDX) or Diamond Dresser MAM-700.
 CHEMICAL FAMILY: METAL ALLOY. CLASSIFICATION: Machine, Machine Parts. D.O.T. SHIPPING CLASS: Class 85

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
IRON	IRON	7439-89-6	10 as Iron Oxide fume	5.0 as Iron Oxide fume	N
NICKEL	NICKEL	7440-02-0	1.0	1.0	Y
DIAMOND	CARBON	7440-44-0	3.5 as Carbon Black	3.5 as Carbon Black	N
CBN	CUBIC BORON NITRIDE	NAIF	NAIF	NAIF	N
COBALT	COBALT	7440-48-4	0.1	.05	N (1)
PHOSPHOROUS	PHOSPHOROUS	7723-14-0	0.1	0.1	N
SULFUR	SULFUR	7704-34-9	13 as Sulfur Dioxide	5.0 as Sulfur Dioxide	N
COPPER	COPPER	7440-50-8	1.0 / 0.1 fume	1.0 / 0.2 fume	N
TIN	TIN	7440-31-5	2.0	2.0 / 2.0 fume	N
MANGANESE	MANGANESE	7439-96-5	5.0	5.0 / 1.0 fume	N
ALUMINUM	ALUMINUM	7429-90-5	NONE	10	N
SILICON	SILICON	7440-21-3	NONE	5 as respirable dust	N
ZINC	ZINC	7440-66-6	5.0 as Zinc Oxide fume	5.0 as Zinc Oxide fume	N
CHROMIUM	CHROMIUM	7440-47-3	1.0	0.5	N (1)

(1) CERTAIN COMPOUNDS OF COBALT AND CHROMIUM HAVE BEEN IDENTIFIED AS SUSPECT HUMAN CARCINOGENS BY I.A.R.C., N.T.P. ANNUAL REPORT.
 NAIF= No applicable information found.

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----7.0 (APPROX)	MELTING POINT----->1700 F
PERCENT VOLATILE BY WEIGHT-----NOT VOLATILE	VAPOR PRESSURE (mm Hg)-----NOT VOLATILE
VAPOR DENSITY (AIR=1)-----NOT VOLATILE	EVAPORATION RATE-----NOT VOLATILE
SOLUBILITY IN WATER-----NOT SOLUBLE	REACTIVITY IN WATER-----NOT REACTIVE
APPEARANCE AND ODOR-----SOLID METAL OBJECT	

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Concentrated acids such as nitric or hydrochloric. HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen gas. Toxic gases and vapors (such as nickel carbonyl and oxides of nitrogen) may be released in a fire involving nickel or in a decomposition of nickel compounds.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES. Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever (flu-like symptoms). Symptoms may be aggravated for sensitive individuals with respiratory conditions (such as emphysema). Persons with light skin, sensitive skin or large amounts of body hair may experience skin disorders from contact with metal fines.

ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

CARBON: ACUTE: SKIN: May cause irritation. EYE: May cause irritation and swelling. INHAL: May cause irritation to the nose or throat (Bronchitis). INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: As graphite. May produce a progressive and disabling lung disease. Symptoms include headache, coughing, depression, decreased appetite, difficult breathing and the production of black sputum. Individuals may be free of symptoms for many years and then suddenly become disabled. INGEST: NAIF.

CHROMIUM: ACUTE: SKIN: Chromium compounds may cause dermatitis. EYE: May cause irritation. INHAL: Dusts of the metal may cause coughing and wheezing, headache, difficult breathing, fever and loss of weight. INGEST: Literature reports the oral toxicity as LD Lo=71 mg/kg (Mamsters). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: There are reports of a nodular type of breathing disease with impairment of lung function. Some insoluble chromium compounds are suspected carcinogens. INGEST: NAIF.

COBALT: ACUTE: SKIN: Cobalt can cause an allergy. Literature reports very small quantities have caused allergic sensitivity type dermatitis. Eruptions are usually located in the flexure creases of the elbow, knee, ankles, and neck. Cross sensitization can occur between cobalt and nickel and chromium. EYE: May cause irritation. INHAL: Cobalt dust inhalation may cause an asthma-like disease characterized by coughing and difficult breathing. INGEST: Literature reports the oral toxicity to be LD Lo=1500 mg/kg (rats). Ingesting cobalt dust can cause vomiting and diarrhea. A sensation of hotness may occur after ingestion of excessive amounts. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Inflammation of the lungs that may be reversible and abnormal tissue growth. INGEST: NAIF.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

IRON: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: The inhalation of iron oxide fumes or dust may cause an apparent benign lung disease which is called siderosis. This disease is reported not to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible. INGEST: NAIF.

MANGANESE: ACUTE: SKIN: NAIF. EYE: May cause slight eye irritation. INHAL: Can cause bronchitis and inflammation of lung. Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. Freshly formed fumes can cause fever and chills similar to the flu. INGEST: Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Manganese poisoning is not fatal but may present a large range of nervous system disorders that vary among individuals. Advanced symptoms are similar to classical Parkinson's disease.

NICKEL: ACUTE: SKIN: NAIF. EYE: Causes eye irritation. INHAL: Nickel is an irritant to the mucous membrane of the upper respiratory tract. INGEST: Literature reports nickel soluble salts are quite toxic and if swallowed may cause giddiness and nausea. CHRONIC: SKIN: Skin sensitization resulting in chronic eczema "Nickel itch". EYE: NAIF. INHAL: Elemental nickel (as deposited from inhalation of nickel carbonyl) and nickel salts may cause cancer (producing an increased incidence of cancer of the lung and nasal passages). Effects on the heart muscle, brain, liver, and kidney have been seen in animal studies. INGEST: NAIF.

PHOSPHOROUS: ACUTE: SKIN: May result in severe burns. EYE: May cause severe irritation or burns. INHAL: Shock may ensue rapidly. INGEST: Literature reports the oral toxicity as LD 50=3030 u gm/kg. Shock may ensue rapidly. CHRONIC: SKIN: Systemic poisoning may follow skin burns. Can cause death of tissue of the jaw. EYE: NAIF. INHAL/INGEST: Systemic poisoning. Can affect the function or cause failure of the liver, kidney, heart or blood vessels.

SILICON: ACUTE: SKIN: Physical damage to the skin caused by dust or by cleaning procedures used to remove it. EYE: Dust may irritate eyes. INHAL: Dust may cause physical damage to the mucous membranes or nasal passages. INGEST: NAIF CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May produce x-ray changes in the lungs without disability. INGEST: NAIF.

SULFUR: ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: May cause excessive tissue fluid in the lungs. Gaseous sulfur dioxide is irritating to mucous membranes of the upper respiratory tract. INGEST: Not toxic. Used in medicine as a laxative. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Chronic exposure may result in inflammation of the nose, fatigue, altered sense of smell, and chronic bronchitis. Symptoms are shortness of breath, cough, and increased mucous excretion. Animal experimentation has indicated that sulfur dioxide may be a possible co-carcinogenic agent. INGEST: NAIF.

TIN: ACUTE: SKIN: May cause skin irritation. EYE: May irritate eyes. INHAL: May irritate the mucous membranes. INGEST: Literature reports the toxicity is low. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Exposure to the dust or fumes of tin oxide can result in a benign lung disease called stannosis. No tissue reaction or breathing disorder has been associated with this lung condition. INGEST: NAIF.

ZINC: ACUTE: SKIN: Zinc oxide may produce a dermatitis called "oxide pox" due primarily to clogging of the sweat glands. EYE: NAIF. INHAL: Can cause flu like symptoms beginning four to twelve hours after exposure. Causes sweet or metallic taste in the mouth, dryness and irritation of the throat. Fever and shaking chills then develop. Symptoms last 24 to 48 hours. INGEST: NAIF. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Brush off excess dust. Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES NORMAL STORAGE AND HANDLING: No special procedures required. NORMAL USE: No special procedures required. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Treat chips or dust as metal alloys. WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION RESPIRATORY PROTECTION: If conditions of use (Dry Honing, cutting, or grinding) give rise to dust use NIOSH approved respirator rated for metal dust to maintain levels of dust well below ACGIH TLV and OSHA PEL/TLV levels. VENTILATION: If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering) give rise to metal fumes use forced ventilation to maintain levels of fumes below ACGIH TLV and OSHA PEL/TLV levels. SKIN PROTECTION: Not required. EYE PROTECTION: Always wear NIOSH approved safety glasses when honing or operating machinery. OTHER EQUIPMENT: No applicable information found. MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Remove traces of material dust if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA: Material in the solid state does not present a fire or explosion hazard. Dust hazards exist under favoring conditions of small particle size. Dispersion in air and strong ignition source may result in an explosion.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/O
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: VGS20522 GEAR OIL

CHEMICAL FAMILY: PETROLEUM HYDROCARBONS AND ADDITIVES. CLASSIFICATION: PETROLEUM OIL N.O.S.
 D.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID. IDENTIFICATION NUMBER: UN1270

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT. %	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
MINERAL OIL	REFINED MINERAL OIL	64742-54-7	Unknown	5 (mist)	5 (mist)	N
MINERAL OIL	REFINED MINERAL OIL	64742-65-0	Unknown	5 (mist)	5 (mist)	N
ADDITIVES	Unknown	Unknown	< 3	NOT ESTABLISHED	NOT ESTABLISHED	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----0.896
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT-----UNKNOWN
 VAPOR PRESSURE (mm Hg)-----<1mm Hg @ 77 F (25 C)
 VAPOR DENSITY (AIR=1)-----UNKNOWN
 EVAPORATION RATE-----NEGLECTIBLE
 SOLUBILITY IN WATER-----NEGLECTIBLE. MATERIAL IS COMPLETELY SOLUBLE IN COMMON HYDROCARBON OR CHLORINATED HYDROCARBON SOLVENTS SUCH AS MINERAL SPIRITS OR TRICHLOROETHANE.
 REACTIVITY IN WATER-----NOT REACTIVE
 APPEARANCE AND ODOR-----AMBER LIQUID.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to Section 7

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDATION AGENTS.
 HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON, NITROGEN AND SULFUR FROM COMBUSTION.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION. ABBREVIATIONS USED IN THE FOLLOWING SECTION.
 SKIN=SKIN CONTACT. EYE=EYE CONTACT. INHAL=INHALATION. INGEST=INGESTION.

MINERAL OIL: ACUTE: SKIN: May cause irritation. Predisposing factors: Individuals with sensitive skin or large amounts of body hair. Material is not sterile and may infect open cuts or sores. EYE: May cause irritation. INHAL: Coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mist or vapors. INGEST: Loose bowel movements. Minute amounts of mineral oil aspirated into the lungs during ingestion may cause mild to severe lung injury. CHRONIC: SKIN: Prolonged or repeated skin contact can cause skin irritation or oil acne: Inflammation and blackheads due to mechanical blockage of the pores. Material is potentially a skin sensitizer. Individuals can experience skin irritation after prolonged exposure. EYE: None known. INHAL: None known. INGEST: None known.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
 EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. SKIN CONTACT: Wash hands with mild non-abrasive soap and water. INGESTION: Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water.
 NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.
 STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. Notify Coast Guard if spill could reach any waterway (1-800-424-8802).
 WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use a NIOSH approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure to well below TLV levels.
 VENTILATION-LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M.
 OTHER: No applicable information found.
 SKIN PROTECTION: Protective gloves (Neoprene or Plastic) should be used. Do not wear oil soaked clothing.
 EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.
 OTHER EQUIPMENT: Oil-impervious apron if desired.
 MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----475 F (246 C) C.O.C.
 FLAMMABLE LIMITS---LEL: Unknown UEL: Unknown
 EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
 SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.
 UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	- HEALTH	1
4=Extreme		
3=High	- FIRE	3
2=Moderate		
1=Slight	- REACTIVITY	0
0=Insignificant		
	- SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
ADDRESS: 7910 Manchester Ave.
St. Louis, Mo. 63143
United States of America

CONTACT: Terry Heller
EMERGENCY PHONE NO: 314-781-2105
APPROVED BY: Terry Heller
TITLE: Manager, Materials R/D
DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: VS-200 VALVE SEAT MARKER
CHEMICAL FAMILY: SPECIALTY LACQUER. CLASSIFICATION:(D.O.Y.) PAINT: D.O.Y. SHIPPING CLASS: FLAMMABLE LIQUID I.D. Number:UN-1263

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT X	OSHA PEL mg/cu m	ACGIH TLV-TWA mg/cu m	CARCINOGENIC
DYES	DYES (METHYL VIOLET)	8004-87-3	1	NONE	NONE	N
SOLVENTS	BUTYL ACETATE	123-86-4	33	150 PPM	150 PPM	N
SOLVENTS	DENATURED ALCOHOL	64-17-5	57	1000 PPM	1000 PPM	N
SOLVENTS	BUTYL ALCOHOL	71-36-3	4	100 PPM	50 PPM SKIN (Ceiling Limit)	N
VEHICLE	WET NITROCELLULOSE	9004-67-63.0	5	NONE	NONE	N

PPM=Parts per Million

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)----- .86
BOILING POINT----- 160 F (71 C)
PERCENT VOLATILE BY WEIGHT----- 90%
VAPOR PRESSURE (mm Hg)----- 36 mm Hg @ 68 F (20C)
VAPOR DENSITY (Air=1)----- Heavier than air.
EVAPORATION RATE ----- Solvent Component: faster than butyl acetate.
Note: Residual marking substances are non-volatile.
SOLUBILITY IN WATER----- Appreciable
REACTIVITY IN WATER----- Not reactive
APPEARANCE AND ODOR----- Intense blue color. Mild odor.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: DO NOT STORE NEAR FIRE OR FLAME.
OTHER: DO NOT SMOKE WHEN FUMES ARE PRESENT. USE WITH POSITIVE VENTILATION.

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SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE.
POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
INCOMPATIBILITY: STRONG OXIDIZING MATERIALS SUCH AS CHLORINE.
(materials to avoid)
DECOMPOSITION PRODUCTS: COMBUSTION OF MATERIAL WILL PRODUCE OXIDES OF CARBON.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

PRIMARY ROUTE(S) OF ENTRY ARE INHALATION, INGESTION AND SKIN CONTACT. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

ACETIC ACID, BUTYL ESTER (N-BUTYL ACETATE): ACUTE: SKIN: Causes irritation of skin. Nonspecific drying, cracking and increased susceptibility to infection. EYE: Causes eye irritation. INHAL: Causes irritation of upper respiratory system. Headache, drowsiness and drunkenness at high concentration. Affects central nervous system. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Kidney and blood changes in experimental animals. Affects lungs, thorax and breathing. INGEST: NAIF.

BUTYL ALCOHOL (N-BUTANOL): ACUTE: SKIN: Causes skin irritation and dermatitis. EYE: Causes irritation and inflammation. INHAL: Irritates the nose and eyes. Affects lungs, thorax and breathing. INGEST: Expected to be non-toxic based on literature reports that the LD50=790 mg/kg (rats). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

ETHYL ALCOHOL: ACUTE: SKIN: May cause drying and irritation. Literature reports the Skin irritation to be 500 mg Severe (Rabbits). EYE: May cause eye irritation. Literature reports the Eye irritation (Rabbits) to be 100 mg- Severe. INHAL: May produce headache, drowsiness, tremors, and fatigue. Literature reports the Inhalation toxicity to be (Rats) LC50=20000 PPM INGEST: Denaturants produce strange symptoms beyond intoxication. May act as an adjuvant increasing toxicity of other agents. Literature reports the Toxicity oral (Rats) LD50=7060 mg/kg. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. SKIN CONTACT: Brush off excess dust. Wash hands with mild non-abrasive soap and water. INGESTION: Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: STORE IN WELL VENTILATED AREAS AWAY FROM SOURCES OF IGNITION AS DAMAGED OR LEAKING CANS WILL RELEASE SOLVENT WHICH IS HIGHLY FLAMMABLE, HEAVIER THAN AIR AND MAY TRAVEL LONG DISTANCES TO A SOURCE OF IGNITION AND FLASH BACK CAUSING THE CONTAINER TO BURN OR EXPLODE. KEEP OUT OF THE REACH OF CHILDREN.

NORMAL USE: USE ONLY WITH ADEQUATE VENTILATION.
STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: VENTILATE AREA. WEAR PERSONAL PROTECTIVE EQUIPMENT. REMOVE HEAT AND IGNITION SOURCES. ABSORB IN WASTE MATERIAL THAT CAN BE BURNED.

WASTE DISPOSAL METHODS: INCINERATE OR NORMAL DISPOSAL FOR FLAMMABLES. DISPOSE OF IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, RULES, ORDERS AND ORDINANCES.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: IF TLV IS EXCEEDED OR FOR SYMPTOMS OF OVER EXPOSURE, WEAR NIOSH APPROVED ORGANIC VAPOR RESPIRATOR.
VENTILATION: ENSURE FRESH AIR ENTRY DURING USE. IF TLV LEVELS ARE APPROACHED OR ANY DISCOMFORT IS EXPERIENCED PROVIDE POSITIVE MECHANICAL VENTILATION.
PROTECTIVE GLOVES: IF PREFERRED OR IF SENSITIVITY TO MATERIAL HAS BEEN DEMONSTRATED.
EYE PROTECTION: ALWAYS WEAR SAFETY GLASSES WHEN WORKING ON OR AROUND MACHINERY.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 61 F (16 C) Method Used: T.O.C.
FLAMMABLE LIMITS LEL (lower) UEL (upper) Method: Unknown.
IN AIR % BY VOLUME 1.4 11.2
EXTINGUISHING MEDIA: FOAM, CARBON DIOXIDE OR DRY CHEMICAL.
SPECIAL FIRE FIGHTING PROCEDURES: WEAR POSITIVE PRESSURE, SELF-CONTAINED RESPIRATORY EQUIPMENT. WATER MAY BE USED TO COOL FIRE EXPOSED CONTAINERS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG GROUND, OR MAY BE MOVED BY VENTILATION AND IGNITED BY SPARKS, FLAME OR OTHER IGNITION SOURCES.

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	1
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: **PM-2653 LUBRICATING OIL**

CHEMICAL FAMILY: PETROLEUM HYDROCARBONS AND ADDITIVES. CLASSIFICATION: PETROLEUM OIL N.O.S.
 O.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID. IDENTIFICATION NUMBER: NA1270

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg/cu m	ACGIH TLV-TWA mg/cu m	CARCINOGENIC
OIL	PETROLEUM DISTILLATE, SEVERELY HYDROTREATED HEAVY NAPHTHENIC	64742-52-5	5 (mist)	5 (mist)	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----0.89
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT-----550 F (285 C)
 VAPOR PRESSURE (mm Hg)-----<.01mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)----->5
 EVAPORATION RATE-----NEGLECTIBLE
 SOLUBILITY IN WATER-----NEGLECTIBLE. MATERIAL IS COMPLETELY SOLUBLE IN COMMON HYDROCARBON OR CHLORINATED HYDROCARBON SOLVENTS SUCH AS MINERAL SPIRITS OR TRICHLOROETHANE.
 REACTIVITY IN WATER-----NOT REACTIVE
 APPEARANCE AND ODOR-----TRANSPARENT AMBER LIQUID WITH MINERAL OIL ODOR.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDATION AGENTS SUCH AS FUMING NITRIC ACID OR LIQUID CHLORINE.
 CONDITIONS TO BE AVOIDED: OXIDIZING CONDITIONS.
 HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF SULFUR, CARBON MONOXIDE AND CARBON DIOXIDE AS PRODUCTS OF COMBUSTION.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION. ABBREVIATIONS USED IN THE FOLLOWING SECTION.
 SKIN=SKIN CONTACT. EYE=EYE CONTACT. INHAL=INHALATION. INGEST=INGESTION.

MINERAL OIL: ACUTE: SKIN: May cause irritation. Predisposing factors: Individuals with sensitive skin or large amounts of body hair. Material is not sterile and may infect open cuts or sores. EYE: May cause irritation. INHAL: Coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mist or vapors. INGEST: Loose bowel movements. Minute amounts of mineral oil aspirated into the lungs during ingestion may cause mild to severe lung injury. **CHRONIC:** SKIN: Prolonged or repeated skin contact can cause skin irritation or oil acne; redness and blackheads due to mechanical blockage of the pores. Material is potentially a skin sensitizer. Individuals can experience skin irritation after prolonged exposure. EYE: None known. INHAL: None known. INGEST: None known.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. **EYE CONTACT:** Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Wash contact areas with mild non-abrasive soap and water. If injected under the skin, regardless of the appearance or its size, contact a physician IMMEDIATELY. Delay may cause loss of affected part of the body. **INGESTION:** Get medical assistance. Do not induce vomiting.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water.

NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. Do not reuse containers for other materials or purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Empty containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. Notify Coast Guard if spill could reach any waterway (1-800-424-8802).

WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use an approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure to well below TLV levels.

VENTILATION: LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M. OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.

OTHER EQUIPMENT: Oil-impervious apron if desired.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----275 F (135 C) C.O.C.

FLAMMABLE LIMITS--- LEL: .9% UEL: 7%

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	- HEALTH	0
4=Extreme		
3=High	- FIRE	1
2=Moderate		
1=Slight	- REACTIVITY	0
0=Insignificant		
	- SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: AN-30 Silicon Compound

CHEMICAL FAMILY: MIXTURE. CLASSIFICATION: NOT APPLICABLE. D.O.T. SHIPPING CLASS: NOT APPLICABLE.

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT. %	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
OIL	PETROLEUM DISTILLATE, SEVERELY HYDROTREATED AND/OR SEVERELY SOLVENT REFINED	UNKNOWN	32	5 (mist)	5 (mist)	N
SILICON	SILICON	7440-21-3	50	None	10 as Nuisance Dust	N
STEARIC ACID	CALCIUM STEARATE	1592-23-0	18	None	10 as Nuisance Dust	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----UNKNOWN
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT----->600 F (316 C)
 VAPOR PRESSURE (mm Hg)-----<1mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----UNKNOWN
 EVAPORATION RATE-----NEGLECTIBLE
 SOLUBILITY IN WATER-----NEGLECTIBLE. OIL AND STEARIC ACID ARE COMPLETELY SOLUBLE IN COMMON HYDROCARBON
 OR CHLORINATED HYDROCARBON SOLVENTS SUCH AS MINERAL SPIRITS OR TRICHLOROETHANE.
 REACTIVITY IN WATER-----NOT REACTIVE
 APPEARANCE AND ODOR-----BLACK PASTE

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidation agents such as fuming nitric acid. CONDITIONS TO BE AVOIDED: oxidizing conditions. HAZARDOUS DECOMPOSITION PRODUCTS: carbon monoxide, carbon dioxide and calcium oxide as products of combustion.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE. PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

CALCIUM STEARATE: ACUTE: SKIN: NAIF. EYE: May cause mechanical irritation. INHAL: Excessive inhalation of dust may cause coughing and difficult breathing and inflammation of the lungs. INGESTION: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Grossly excessive and chronic inhalation of the dust may cause a progressive lung disease. INGEST: NAIF.

MINERAL OIL: ACUTE: SKIN: May cause irritation. Predisposing factors: Individuals with sensitive skin or large amounts of body hair. Material is not sterile and may infect open cuts or sores. EYE: May cause irritation. INHAL: Coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mist or vapors. INGEST: Loose bowel movements. Minute amounts of mineral oil aspirated into the lungs during ingestion may cause mild to severe lung injury. CHRONIC: SKIN: Prolonged or repeated skin contact can cause skin irritation or oil acne; redness and blackheads due to mechanical blockage of the pores. Material is potentially a skin sensitizer. Individuals can experience skin irritation after prolonged exposure. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

SILICON: ACUTE: SKIN: Physical damage to the skin caused by dust or by cleaning procedures used to remove it. EYE: Dust may irritate eyes. INHAL: Dust may cause physical damage to the mucous membranes or nasal passages. INGEST: NAIF CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May produce x-ray changes in the lungs without disability. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.

SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. INGESTION: Get medical assistance.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. If stored outdoors, store so as to shed water. NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. Do not reuse containers for other materials or purposes. All precautions detailed on the container label apply to partially full or empty containers. Do not attempt to clean as residue is difficult to remove. Containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations. WASTE DISPOSAL METHODS: AN-30 Silicon Compound and the used felt Set contain mineral oil, a hazardous waste. Dispose of the used felt Set and Silicon Compound in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to excessive mist (greater than 5 mg/cu M) use a NIOSH approved respirator rated for mineral oil mist or forced ventilation to reduce mist exposure below TLV levels.

VENTILATION-LOCAL: Normal. MECHANICAL: Required if use conditions give rise to levels greater than 5 mg/cu M. OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Use chemical safety goggles. Contact lenses should not be worn when working with this material.

OTHER EQUIPMENT: Oil-impervious apron if desired.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----400 F (204 C) ASTM D-92

FLAMMABLE LIMITS--- LEL: 0.6 UEL: 7.0

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	- HEALTH	0
4=Extreme	- FIRE	2
3=High	- REACTIVITY	0
2=Moderate	- SPECIFIC HAZARD	NONE
1=Slight		
0=Insignificant		



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: PG-991 Anti-Rust Compound

CHEMICAL FAMILY: Mixture of hydrocarbons refined from petroleum.

CLASSIFICATION: NOT APPLICABLE

D.O.T. SHIPPING CLASS: NOT APPLICABLE

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT. %	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
GREASE	REFINED PETROLEUM	8009-03-8	90	5 (mist)	5 (mist)	N
CAMPHOR	CAMPHOR	76-22-2	10	2	12	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----0.84 (APPROX.)
 PERCENT VOLATILE BY WEIGHT-----<10%
 MELTING POINT-----120 F (49 C) APPROX.
 VAPOR PRESSURE (mm Hg)-----Unknown
 VAPOR DENSITY (AIR=1)-----Unknown
 EVAPORATION RATE -----NEGLECTIBLE
 SOLUBILITY IN WATER-----NEGLECTIBLE
 REACTIVITY IN WATER-----NOT REACTIVE
 APPEARANCE AND COLOR-----SEMI-SOLID WHITE GREASE

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to Section 7

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.

POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDATION AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE FROM COMBUSTION.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE. PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NA=NO APPLICABLE INFORMATION FOUND, SK=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

CAMPHOR: ACUTE: SKIN: May cause skin irritation. EYE: May cause eye irritation. INHAL: Irritates mucous membranes. Affects central nervous system causing nausea, vomiting, diarrhea, headaches, dizziness, excitement, irrational behavior and convulsions. INGEST: Irritates mucous membranes. Affects central nervous system causing nausea, vomiting, diarrhea, headaches, dizziness, excitement, irrational behavior and convulsions. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

PETROLEUM GREASE: Fully refined materials meeting the requirements of the United States Pharmacopoeia XXI and the requirements of the Food and Drug Administration as per Title 21 parts 172.880 and 178.3700. ACUTE: SKIN: Prolonged repeated contact can cause skin irritation or oil acne due to the mechanical blockage of the skin pores. Predisposing factors: Usually individuals with sensitive skin or large amounts of body hair. EYE: May cause eye irritation. INHAL: None known. INGEST: None known. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.

EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame. Maximum storage temperature 250 F (120 C).

NORMAL USE: May cause skin irritation and/or defat the skin on prolonged or repeated contact. Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Do not transfer to unlabeled containers. FOR INDUSTRIAL USE ONLY. Not suitable for use in or around household or dwelling. Containers should be disposed of in an environmentally safe manner and in accordance with applicable governmental regulations.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Absorb on fire retardant absorbent. Gather and dispose of in accordance with applicable regulations.

WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: None required under normal conditions of use with adequate ventilation.

VENTILATION-LOCAL: Normal. **MECHANICAL:** Required if odors are present or operator experiences any discomfort.

OTHER: No applicable information found.

SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed. Do not wear oil soaked clothing.

EYE PROTECTION: Always wear NIOSH approved eye protection when working around or operating machinery.

OTHER EQUIPMENT: No applicable information found.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lubricating oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----190 F (88 C) ASTM D-93

FLAMMABLE LIMITS--- LEL: Unknown UEL: Unknown

EXTINGUISHING MEDIA: Carbon dioxide, foam and dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: For fires in enclosed areas, firefighters must use self-contained breathing apparatus. Water spray is an unsuitable extinguishing agent.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

NOTICE

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MFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	0
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen AN-994A or AN-980 ABRASIVE CONE

CHEMICAL FAMILY: No applicable information found. CLASSIFICATION: Not applicable D.O.T. SHIPPING CLASS: Not applicable

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
CRYOLITE	SODIUM FLUOALUMINATE	15096-52-3	2.5	2.5	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1): Unknown
 MELTING POINT: Unknown
 PERCENT VOLATILE BY WEIGHT: Not volatile
 VAPOR PRESSURE (mm Hg): Not volatile
 VAPOR DENSITY (AIR=1): Not volatile
 EVAPORATION RATE: Not volatile
 SOLUBILITY IN WATER: Not soluble
 REACTIVITY IN WATER: Not reactive
 APPEARANCE AND ODOR: Solid material. May give off odor in use.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: MATERIAL IS STABLE UNDER NORMAL CONDITIONS OF TRANSPORT AND STORAGE.
 POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
 INCOMPATIBILITY (MATERIALS TO AVOID): None known

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE. PRIMARY ROUTE(S) OF ENTRY ARE: INGESTION, INHALATION AND SKIN ABSORPTION. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

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SODIUM FLUOALUMINATE: ACUTE: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: Acute toxicity by ingestion is known to be very low. Literature reports the toxicity as LD50=200 mg/kg (Oral Rats). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Changes in skeleton noted on X-rays. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
 EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical attention to check for possible irritation. SKIN CONTACT: Brush off excess dust. Wash hands with mild non-abrasive soap and water. INGESTION: Seek medical attention.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: No special procedures.
 NORMAL USE: Normal precautions should be taken for nuisance dust and particulates generated during grinding which will be principally from the workpiece rather than the product.
 STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Normal cleanup procedures.
 WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Utilize approved respiratory protection for nuisance dust.
 VENTILATION LOCAL: Normal
 MECHANICAL: Utilize forced ventilation to keep airborne concentration of dust below limits.
 SKIN PROTECTION: Protective gloves recommended when grinding.
 EYE PROTECTION: Always wear NIOSH approved safety glasses when operating machinery. See OSHA 29 CFR 1910.133.
 OTHER EQUIPMENT: Hearing protection if noise levels exceed NIOSH/OSHA TLV/PEL levels. See OSHA 29 CFR 1910.215

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Unknown
 FLAMMABLE LIMITS LEL (lower) UEL (upper)
 IN AIR % BY VOLUME Unknown Unknown
 EXTINGUISHING MEDIA: FOAM, CARBON DIOXIDE, DRY CHEMICAL, WATER
 SPECIAL FIRE FIGHTING PROCEDURES: NONE
 UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	HEALTH	0
4=Extreme		
3=High	FIRE	1
2=Moderate		
1=Slight	REACTIVITY	0
0=Insignificant		
	SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: MAN-852-5 and MAN-852-55 HONING OIL

CHEMICAL FAMILY: ANIMAL FATTY OIL AND SYNTHETIC FATTY ACID ESTER BLEND.

CLASSIFICATION: NOT APPLICABLE

D.O.T. SHIPPING CLASS: NOT APPLICABLE

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	WT % X Range	CARCINOGENIC
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WHEN EVALUATED IN ACCORDANCE WITH THE PROVISIONS OF THE FEDERAL HAZARD
 COMMUNICATION RULE 29 CFR 1910.1200 MAN-852 WAS JUDGED TO BE NON-HAZARDOUS.

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS
 MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----.95
 PERCENT VOLATILE BY WEIGHT-----<1%
 BOILING POINT-----600 F (315 C)
 VAPOR PRESSURE (mm Hg)-----<1mm Hg @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----Heavier than air.
 EVAPORATION RATE-----Negligible
 SOLUBILITY IN WATER-----Negligible. Material is completely soluble in common hydrocarbon or chlorinated hydrocarbon solvents such as mineral spirits or trichloroethane.
 REACTIVITY IN WATER-----No hazardous reactions.
 APPEARANCE AND ODOR-----Amber color liquid with fatty odor.

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: Store away from heat or flame. Read and follow container warnings. Refer to MSDS Section 7 & 8

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur.
 INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidation agents such as fuming nitric acid.
 CONDITIONS TO BE AVOIDED: Oxidizing conditions. HAZARDOUS DECOMPOSITION PRODUCTS: Combustion will form Carbon monoxide.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

PRIMARY ROUTE(S) OF ENTRY ARE: INHALATION AND SKIN ABSORPTION.

Abbreviations used in the following section: SKIN=Skin absorption. EYE=Eye contact. INHAL=Inhalation INGEST=Ingestion.

FATTY OIL: ACUTE: SKIN: Prolonged repeated skin contact can cause skin irritation or oil acne, inflammation and blackheads due to mechanical blockage of the pores. Predisposing factors: Usually individuals with sensitive skin or large amounts of body hair. Material is not sterile and may infect open cuts or sores. EYE: May irritate the eyes. INGEST: Loose bowel movements. Acute oral toxicity: LD 50>5 gm./kg. (rats). INHAL: Not established. Suggest ACGIH limits for vegetable oil mists of 5 mg/cu m. be observed. Symptoms of overexposure include coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mists or vapors. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation.

SKIN CONTACT: Wash contact areas with mild non-abrasive soap and water. INGESTION: Do not induce vomiting. Call physician or poison control center immediately.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame as the material will expand if overheated and possibly rupture the container spilling the contents. The spilled material will create a slip hazard and will burn if ignited. If stored outdoors, store so as to shed water to prevent rusting of drums and spilling contents. Plastic containers are brittle if frozen and may split and leak if handled roughly. Spilled material creates a fall/slip hazard. Since emptied containers retain material residue, follow label warnings even after container is emptied and do not reuse container for other purposes. Do not cut, braze, weld, solder, pressurize or introduce ignition sources in or around container. Do not transfer to unlabeled containers. For industrial use only. Material should be heated to 100 F and mixed prior to transfer of contents if product separates as a result of cold storage (1<50 F). Vent container if heating. Use drum heater for drums. Pails may be immersed in hot water to warm contents. Use personal protection equipment and precautions as specified in Section 8.

NORMAL USE: Material is for use in Honing Machines only. Material may be mixed with other Sunnen Honing Oils only. Clean material from parts using alkaline cleaner. Pollution by any amount of water or alkaline material will lead to the formation of soaps that clog the Honing Machine oil filter.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Contain and absorb on fire-retardant treated sawdust, diatomaceous earth or other suitable absorbent. Notify Coast Guard if spill could reach any waterways (1-800-424-8802) and also local/state authorities. Spilled material is greasy and produces a slip/fall hazard.

WASTE DISPOSAL METHOD: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to mist levels >5 mg/cu m or if operator experiences any respiratory irritation use NIOSH approved respirator rated for use with mineral or vegetable oil mist.

VENTILATION LOCAL: Normal ventilation.

MECHANICAL: Required if use conditions give rise to mist levels greater than 5 mg/cu m or if operator experiences any respiratory or eye irritation.

PROTECTIVE GLOVES: If preferred or if sensitivity to material has been demonstrated use gloves rated for animal or vegetable oil.

EYE PROTECTION: Glasses or goggles to prevent inadvertent splashing of material into eyes. Always wear safety glasses while working around or operating machinery.

OTHER PROTECTION: Apron or barrier cream if desired. Do not wear oil-soaked clothing as it may cause skin irritation or oil acne.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Same as for petroleum lub oil. Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources by cleaning with caustic cleaners.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----410 F (210 C) ASTM D-92

FLAMMABLE LIMITS IN AIR: Unknown.

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: None

AUTO-IGNITION TEMPERATURE: NAIF

UNUSUAL FIRE AND EXPLOSION HAZARDS: Combustion will produce oxides of Carbon. Sealed containers may leak, burst or explode, releasing contents and spreading fire, if exposed to extreme heat.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	- HEALTH	0
4=Extreme		
3=High	- FIRE	1
2=Moderate		
1=Slight	- REACTIVITY	0
0=Insignificant		
	- SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: Sunnen KG3X Honing Oil

CHEMICAL FAMILY OR PRODUCT TYPE: Non-Petroleum fatty oil with preservative.

CLASSIFICATION: NOT APPLICABLE

D.O.T. SHIPPING CLASS: NOT APPLICABLE

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT. %	OSHA PEL	ACGIH TLV-TWA	CARCINOGENIC
				mg./cu. m.	mg./cu. m.	

WHEN EVALUATED IN ACCORDANCE WITH THE PROVISIONS OF THE FEDERAL HAZARD COMMUNICATION RULE 29 CFR 1910.1200 KG3X WAS JUDGED TO BE NON-HAZARDOUS.

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----: .905
 BOILING POINT-----: 460 F (238 C)
 MELTING POINT-----: 35 F (2 C) (Congeals)
 VAPOR PRESSURE (mm Hg)-----: <1 @ 68 F (20 C)
 VAPOR DENSITY (AIR=1)-----: >20 Est.
 EVAPORATION RATE (CCI4=1)-----: Not volatile
 SOLUBILITY IN WATER-----: < 1%
 REACTIVITY IN WATER-----: No hazardous reactions.
 APPEARANCE AND ODOR-----: Amber color liquid with fatty odor.

SECTION 4 SPECIAL PRECAUTIONS

HANDLING AND STORAGE: None. Read and follow container warnings. Refer to Section 7 & 8

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Material is stable.
 POLYMERIZATION: Material will not polymerize.
 INCOMPATIBILITY (materials to avoid): Material will slowly corrode and stain metals.
 DECOMPOSITION PRODUCTS: Combustion of material will produce oxides of Carbon. Material is organic and will slowly oxidize and decay forming compounds containing Carbonyl group, Hydroxyl group, Carboxyl group, Oxirane, glycerol, hydroperoxides, aldehydes, ketones and acids.

CONDITIONS TO BE AVOIDED: Avoid contact with strong oxidizers such as hot fuming Nitric or Sulfuric acid as they cause the material to ignite and burn. If the material is in a closed container (such as a drum), the container can explode.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE: SKIN: Prolonged or repeated contact can cause skin irritation or oil acne: folliculitis and comedones due to mechanical blockage of the follicular orifices. Predisposing factors: usually individuals with sensitive skin or large amounts of body hair. EYE: Overheating (>200 F) used material can release Acrolein (an eye irritant) causing redness and burning of the eyes. INHAL: Symptoms of overexposure include coughing, sore throat, headache, chest pain and difficult breathing. Predisposing factors: Individuals with pre-existing respiratory impairments (such as emphysema) can display increased sensitivity to oil mist or vapors. INGEST: Loose bowel movements. **CHRONIC:** SKIN: Material is potentially a skin sensitizer. Individuals can experience skin irritation after prolonged exposure. Material is not sterile and may infect open cuts or sores. EYE: NAIF. INHAL: NAIF. INGEST: NAIF. OTHER: Material will support the growth of bacteria, mold and fungus.

EMERGENCY FIRST AID

INHALATION: Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, begin mouth to mouth resuscitation. **EYE CONTACT:** Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. **SKIN CONTACT:** Wash contact areas with mild non-abrasive soap and water. **INGESTION:** Do not induce vomiting. Get medical assistance.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame as the material will expand if overheated and possibly rupture the container spilling the contents. The spilled material will create a slip hazard and will burn if ignited. If stored outdoors, store so as to shed water to prevent rusting of drums and spilling contents. Plastic containers are brittle if frozen and may split and leak if handled roughly. Spilled material creates a fall/slip hazard. Since emptied containers retain material residue, follow label warnings even after container is emptied. Material should be heated to 100 F and mixed prior to transfer of contents if product separates as a result of cold storage (1<50 F). Vent container if heating. Use drum heater for drums. Pails may be immersed in hot water to warm contents. Refer to MSDS Section 8.

NORMAL USE: Material is for use in Honing Machines only. Material may be mixed with other Sunnen Honing Oils only. Clean material from parts using alkaline cleaner. Pollution by any amount of water or alkaline material will lead to the formation of soaps that clog the Honing Machine oil filter.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Contain and absorb on fire-retardant treated sawdust, diatomaceous earth or other suitable absorbent. Notify Coast Guard if spill could reach any waterways (1-800-424-8802) and also local/state authorities. Spilled material is greasy and produces a slip/fall hazard.

WASTE DISPOSAL METHOD: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to mist levels >5 mg/cu m or if operator experiences any respiratory irritation use respirator rated for use with mineral or vegetable oil.

VENTILATION LOCAL: Normal ventilation.

MECHANICAL: Required if use conditions give rise to mist levels greater than 5 mg/cu m or if operator experiences any respiratory or eye irritation.

PROTECTIVE GLOVES: If preferred or if sensitivity to material has been demonstrated use gloves rated for animal or vegetable oil.

EYE PROTECTION: Glasses or goggles to prevent inadvertent splashing of material into eyes. Always wear safety glasses while honing.

OTHER PROTECTION: Apron, if desired. Do not wear oil-soaked clothing as it may cause skin irritation or oil acne.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL:
Same as for petroleum lub oil. Remove traces of material if soldering, welding, brazing, cutting
or other process involving ignition sources by cleaning with caustic cleaners.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT= 370 F (188 C) Method used: ASTM D-92

FLAMMABLE LIMITS

IN AIR % BY VOLUME LEL (lower)= Unknown UEL (upper)= Unknown Method:ASTM E-681

AUTO-IGNITION TEMPERATURE= Unknown

EXTINGUISHING MEDIA: Foam, Carbon Dioxide, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES: Treat as an oil fire. Do not use water as material will float and spread on water.

Wear self-contained breathing gear in involved area.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Combustion will produce oxides of Carbon. Sealed containers may leak, burst or explode,
releasing contents and spreading fire.

NOTICE

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NFPA DESIGNATION 704

HAZARD RATING	- HEALTH	0
4=Extreme		
3=High	- FIRE	1
2=Moderate		
1=Slight	- REACTIVITY	0
0=Insignificant		
	- SPECIFIC HAZARD	NONE



MATERIAL SAFETY DATA SHEET

SECTION 1 NAME AND PRODUCT

MANUFACTURER'S NAME: SUNNEN PRODUCTS COMPANY
 ADDRESS: 7910 Manchester Ave.
 St. Louis, Mo. 63143
 United States of America

CONTACT: Terry Heller
 EMERGENCY PHONE NO: 314-781-2105
 APPROVED BY: Terry Heller
 TITLE: Manager, Materials R/D
 DATE: August 15, 1987

TRADE NAME, COMMON NAME OR SPECIFICATION: COS-155 or COS-155-5 COOLANT

CHEMICAL FAMILY: PETROLEUM HYDROCARBONS AND ADDITIVES. CLASSIFICATION: PETROLEUM OIL N.O.S.
 D.O.T. SHIPPING CLASS: COMBUSTIBLE LIQUID. IDENTIFICATION NUMBER: HA1270

SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	WT.%	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
OIL	SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE	64742-53-6	>93	5 (mist)	5 (mist)	N
OIL	SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE	64742-52-5	> 3	5 (mist)	5 (mist)	N

FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----.892 @ 77 F (25 C)
 BOILING POINT-----320 F (160 C)
 REACTIVITY IN WATER-----NO HAZARDOUS REACTIONS
 APPEARANCE AND ODOR-----REDDISH BROWN LIQUID WITH MINERAL OIL ODOR.
 SOLUBILITY IN WATER-----APPROXIMATELY 25% BY VOLUME OF WATER IS SOLUBLE IN THE MATERIAL. MATERIAL IS ALSO SOLUBLE IN PETROLEUM SOLVENTS SUCH AS MINERAL SPIRITS.

PERCENT VOLATILE BY WEIGHT-----NEGLECTIBLE
 VAPOR PRESSURE (mm Hg)-----NEGLECTIBLE
 VAPOR DENSITY (AIR=1)-----HEAVIER THAN AIR
 EVAPORATION RATE -----NEGLECTIBLE

SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: Store away from heat or flame. Read and follow container warnings. Refer to Section 7 & 8.

SECTION 5 CORROSIVITY AND REACTIVITY DATA

STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidation agents such as fuming Nitric Acid. Product may react with alkalis such as parts cleaners to form soaps and/or emulsions. CONDITIONS TO BE AVOIDED: Oxidizing conditions. HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen Chloride and oxides of Sulfur, Carbon and Nitrogen from combustion.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE

PRIMARY ROUTE(S) OF ENTRY ARE: INHALATION AND SKIN ABSORPTION.

ACUTE: Prolonged repeated skin contact with material may lead to irritation caused by dissolving of the natural oils from the skin causing slight skin irritation. ORAL TOXICITY (RATS): Not established. Estimated to be slightly toxic based on testing of similar products. DERMAL TOXICITY (RABBITS): Not established. Estimated to be slightly toxic based on testing of similar products. INHALATION TOXICITY (RATS): Not established. EYE IRRITATION (RABBITS): Not established. May irritate the eyes. SKIN IRRITATION (RABBITS): Not established. May cause slight irritation on prolonged or repeated contact.--Based on testing of similar products and/or the components.

CHRONIC: No applicable information found.

EMERGENCY FIRST AID

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.
 EYE CONTACT: Remove contact lenses (if wearing) and flush eyes with water for 15 minutes. Seek medical attention to check for possible irritation. SKIN CONTACT: Wash hands with mild non-abrasive soap and water.
 INGESTION: Do not induce vomiting. Get medical assistance. (Note to physician: Material if aspirated into the lungs may cause chemical pneumonitis. Treat appropriately).

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: Store away from heat or flame as the material will expand if overheated and possibly rupture the container, spilling the contents. Plastic containers are brittle if frozen and may split and leak if handled roughly. The spilled material will create a slip hazard and will burn if ignited. Since emptied containers retain material residue, follow label warnings even after container is emptied and do not reuse container for other purposes. Do not cut, braze, weld, solder, or pressurize container as doing so may cause container to EXPLODE, potentially causing serious injury or DEATH. Do not transfer to unlabeled containers. For industrial use only. Not suitable for use in or around household or dwelling. All precautions detailed on the container label apply to partially full or empty containers.

NORMAL USE: Practice good personal hygiene by washing hands several times each day. Launder contaminated clothing before reuse. Avoid wearing clothing soaked with fluid. Avoid prolonged inhalation of mist or vapors. Clean material from parts using alkaline cleaner. Use personal protection equipment and precautions as specified in Section 8. Read caution statements and follow instructions on container label.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Contain and absorb on fire-retardant treated sawdust, diatomaceous earth or other suitable absorbent. Notify Coast Guard if spill could reach any waterways (1-800-424-8502) and also local/state authorities. Spilled material is greasy and produces a slip/fall hazard.

WASTE DISPOSAL METHOD: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If use conditions give rise to mist levels >5 mg/cu m or if operator experiences any respiratory irritation use NIOSH approved respirator rated for use with mineral oil mist.

VENTILATION LOCAL: Normal ventilation.

MECHANICAL: Required if use conditions give rise to mist levels greater than 5 mg/cu m or if operator experiences any respiratory or eye irritation.

PROTECTIVE GLOVES: If preferred or if sensitivity to material has been demonstrated use gloves rated for mineral oil.

EYE PROTECTION: Glasses or goggles to prevent inadvertent splashing of material into eyes. Always wear safety glasses while working around or operating machinery.

OTHER PROTECTION: Apron or barrier cream if desired. Do not wear oil-soaked clothing as it may cause skin irritation or oil acne.

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Remove traces of material if soldering, welding, brazing, cutting or other process involving ignition sources by cleaning with caustic cleaners.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT-----270 F (132 C) ASTM D-93

FLAMMABLE LIMITS--- Not established

EXTINGUISHING MEDIA: Carbon dioxide, foam and dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Sealed containers may explode if exposed to extreme heat.

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